ORAL ARGUMENT NOT YET SCHEDULED

No. 20-1357

Consolidated with Nos. 20-1359, 20-1363

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

STATE OF CALIFORNIA, et al.,

Petitioners,

v.

ANDREW WHEELER, ADMINISTRATOR, UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY, et al.,

Respondents.

EMERGENCY MOTION FOR STAY PENDING REVIEW;
MOTION FOR EXPEDITED REVIEW

XAVIER BECERRA
Attorney General of California
ROBERT W. BYRNE
EDWARD H. OCHOA
Senior Assistant Attorneys General
GARY E. TAVETIAN
DAVID A. ZONANA
Supervising Deputy Attorneys General

TIMOTHY E. SULLIVAN
KAVITA LESSER
CAITLAN MCLOON
MEREDITH J. HANKINS
Deputy Attorneys General
300 South Spring Street
Los Angeles, CA 90013
Telephone: (213) 269-6177
Meredith.Hankins@doj.ca.gov

Attorneys for Petitioner State of California, by and through Attorney General Xavier Becerra, and the California Air Resources Board

Additional counsel listed in signature block

CERTIFICATE OF PARTIES

Pursuant to D.C. Circuit Rule 28(a)(1)(A), the State of California, by and through Attorney General Xavier Becerra, and the California Air Resources Board; the State of Colorado, by and through Attorney General Philip J. Weiser and the Colorado Department of Public Health and Environment; the States of Connecticut, Delaware, Illinois, Maine, Maryland, Michigan, Minnesota, New Jersey, New Mexico, New York, North Carolina, Oregon, Rhode Island, Vermont, and Washington; the Commonwealths of Massachusetts, Pennsylvania, and Virginia; the City of Chicago; the District of Columbia; and the City and County of Denver (collectively, "State Petitioners") hereby certify as follows:

(A) Parties and Amici

Petitioners (Case No. 20-1357): the State of California, by and through Attorney General Xavier Becerra, and the California Air Resources Board; the State of Colorado, by and through Attorney General Philip J. Weiser and the Colorado Department of Public Health and Environment; the States of Connecticut, Delaware, Illinois, Maine, Maryland, Michigan, Minnesota, New Jersey, New Mexico, New York, North Carolina, Oregon, Rhode Island, Vermont, and Washington; the Commonwealths of Massachusetts, Pennsylvania, and Virginia; the City of Chicago; the District of Columbia; and the City and County of Denver.

Petitioners (Case No. 20-1359): Environmental Defense Fund, Center for Biological Diversity, Clean Air Council, Earthworks, Environmental Integrity Project, Food & Water Watch, Ft. Berthold Protectors of Water and Earth Rights, National Parks Conservation Association, Natural Resources Defense Council, and Sierra Club.

Petitioners (Case No. 20-1363): Environmental Law & Policy Center.

Respondents (Case Nos. 20-1357, 20-1359, and 20-1363): United States Environmental Protection Agency and Andrew Wheeler, in his official capacity as Administrator of the EPA.

Intervenors: None.

Amici: None.

CERTIFICATE OF COMPLIANCE WITH CIRCUIT RULE 18(A)(1)

State Petitioners certify that this Emergency Motion for Stay complies with Circuit Rule 18(a)(1). State Petitioners requested relief from Respondents United States Environmental Protection Agency ("EPA") and Administrator Andrew Wheeler via letter submitted electronically and by hard copy on September 15, 2020. A070. After receiving no response to State Petitioners' letter requesting an immediate stay of the rule, State Petitioners filed this motion for emergency relief on September 18, 2020.

State Petitioners provided notice of this filing to Simi Bhat, counsel for EPA and Administrator Wheeler, via telephone on September 17, 2020.

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INTRODUCTION

Pursuant to Federal Rules of Appellate Procedure 18 and 27 and D.C. Circuit Rules 18 and 27, the States of California, by and through Attorney General Xavier Becerra, and the California Air Resources Board, the State of Colorado, by and through Attorney General Philip J. Weiser and the Colorado Department of Public Health and Environment, the States of Connecticut, Delaware, Illinois, Maine, Maryland, Michigan, Minnesota, New Jersey, New Mexico, New York, North Carolina, Oregon, Rhode Island, Vermont, and Washington; the Commonwealths of Massachusetts, Pennsylvania, and Virginia, the City of Chicago; the District of Columbia; and the City and County of Denver (collectively, “State Petitioners”) respectfully move for a stay pending judicial review of a final action by the U.S. Environmental Protection Agency (EPA). 85 Fed. Reg. 57,018 (Sept. 14, 2020) (the Rescission Rule). The Rescission Rule took effect immediately upon publication, bypassing the usual 60-day delayed effective date with no explanation, and allowing emission of thousands of tons of harmful air pollutants that were previously controlled. On September 17, 2020, the Court entered an administrative stay of the Rule pending resolution of motions to stay. In the alternative, State Petitioners request expedited briefing and consideration of the case.

SUMMARY OF ARGUMENT

EPA's Rescission Rule repealed emissions standards for new, reconstructed, and modified sources in the oil and natural gas sector that had been in place for over four years. *See* 40 C.F.R. part 60, subpart OOOOa ("2016 Standard"); 81 Fed. Reg. 35,824 (June 3, 2016). The 2016 Standard secured reductions of methane, a potent greenhouse gas, from the largest industrial source of methane in the country. 85 Fed. Reg. at 57,030. The 2016 Standard thus helped to prevent and mitigate the significant harms that climate change poses to human health and the environment while increasing revenue from recovered natural gas that would otherwise be emitted. Finalization of the 2016 Standard for new sources also triggered the requirement for EPA to regulate existing sources in the oil and natural gas sector. *See* 42 U.S.C. § 7411(d); 40 C.F.R. § 60.22a(a).

But since the change of Administration, EPA has unlawfully stayed, amended, and now entirely reversed its own efforts to control methane emissions from the oil and natural gas sector.[1] The Rescission Rule thus marks the

[1] EPA also faces a legal challenge brought by a subset of State Petitioners seeking to enforce EPA's nondiscretionary duty under section 111(d) to issue methane emission guidelines for existing sources in the oil and natural gas sector. *See New York v. EPA*, No. 1:18-cv-00773-RBW (D.D.C. filed Apr. 5, 2018), A415. On August 13, 2020, one day before its opposition to Plaintiffs' Motion for Summary Judgment was due in the existing source litigation, EPA signed the Rescission Rule, which the agency now argues moots its obligation to regulate existing sources. A450-451.

culmination of EPA's efforts to dismantle the 2016 Standard by impermissibly removing sources in the transmission and storage segment of the oil and natural gas sector from all regulatory requirements, rescinding methane standards for the entire sector, and concluding that EPA now lacks authority to regulate methane emissions from over 850,000 existing oil and natural gas sources across the nation. Not even accounting for the impact on existing sources, EPA admits that the Rescission Rule will increase methane emissions by 448,000 tons (10.1 million tons in terms of carbon dioxide equivalent), volatile organic compound emissions by 12,000 tons, and hazardous air pollutants by 400 tons by 2030 as compared to the 2016 Standard. 85 Fed. Reg. at 57,065.

State Petitioners respectfully request that the Court stay the Rescission Rule. State Petitioners are likely to prevail on the merits and, absent a stay, State Petitioners would be significantly and immediately harmed by the increase in air pollution that will now be permitted, harming public health and the environment, and posing a special risk to our most vulnerable residents. In the alternative, State Petitioners respectfully request expedited briefing and consideration of this case.

BACKGROUND

I. STATUTORY AND REGULATORY FRAMEWORK

Section 111 of the Clean Air Act contains the New Source Performance Standards program, which requires EPA to follow certain steps in regulating categories of stationary (non-vehicle) sources of air pollution. First, EPA must establish a list of source categories and "shall include a category of sources in such list if in [the EPA Administrator's] judgment it causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare." 42 U.S.C. § 7411(b)(1)(A). In making that determination, EPA evaluates the emissions from both new and existing sources, an industry-wide approach this Court has upheld. 84 Fed. Reg. 50,244, 50.269 n.85 (Sept. 24, 2019) (citing *Nat'l Lime Ass'n v. EPA*, 627 F.2d 416, 433 n.48 (D.C. Cir. 1980)).

After listing a source category, EPA "shall" promulgate "standards of performance" for new sources in that source category, 42 U.S.C. § 7411(b)(1)(B), including existing sources that are modified or reconstructed thereafter, *id.* § 7411(a)(2). Once EPA establishes standards for new sources under section 111(b) of the Clean Air Act, EPA is then required under section 111(d) to publish guidelines for controlling emissions from existing sources in that source category. *See* 42 U.S.C. § 7411(d); 40 C.F.R. § 60.22a(a). Thus, EPA's issuance of new source performance standards triggers the agency's obligation to control emissions from existing sources.

II. Regulation of the Oil and Natural Gas Industry under Section 111 of the Clean Air Act

In 1979, EPA listed crude oil and natural gas production under section 111(b) of the Clean Air Act as a source category that contributes significantly to air pollution that may reasonably be anticipated to endanger public health and welfare based on emissions from both new and existing sources. *See* 44 Fed. Reg. 29,222 (Aug. 21, 1979). In 1985, EPA promulgated new source performance standards for the production and processing segment of the oil and natural gas source category. 50 Fed. Reg. 26,122 (June 24, 1985). In 2012, EPA updated the standards by adding volatile organic compound and hazardous air pollutant standards for the transmission and storage segment. 77 Fed. Reg. 49,490 (Aug. 16, 2012).

III. The 2016 Standard

Based on compelling data and a robust administrative record, EPA promulgated the 2016 Standard to reduce emissions of methane, volatile organic compounds, and other pollutants from new and modified production, gathering, processing, transmission and storage equipment in the oil and natural gas industry. 81 Fed. Reg. 35,824 (June 3, 2016).

Methane emissions. The oil and natural gas industry is the largest industrial emitter of methane in the United States. Methane is a potent greenhouse gas and the second leading climate-forcing agent after carbon dioxide. A181. In the 2016 Standard rulemaking, EPA explicitly determined under section 111(b)(1)(A) that methane emissions from the production, processing, transmission, and storage segments of the industry together significantly contribute to air pollution that may endanger public health or welfare. 81 Fed. Reg. at 35,833-40; *see also* 74 Fed. Reg. 66,496 (Dec. 15, 2009). The 2016 Standard aimed to reduce methane leaks from sources within the sector, such as hydraulic fracturing of wells, pumps and compressors that propel oil and natural gas through thousands of miles of pipelines, and the systems of piping at natural gas processing plants. 81 Fed. Reg. at 35,825. Additionally, the 2016 Standard also encouraged the use of emerging technology in leak monitoring. *Id.* at 35,826, 35,846.

Volatile Organic Compounds and Hazardous Air Pollutants. The 2016 Standard also tightened emission controls for volatile organic compounds and hazardous air pollutants for all regulated segments of the source category. 81 Fed. Reg. at 35,825. The public health impacts of volatile organic compounds, the main precursor to the formation of ozone, are well documented. *Id*. at 35,889. Short-term exposure leads to harmful respiratory symptoms such as airway inflammation and asthma, and long-term exposure may result in premature death from lung and heart disease. *Id.* Children and people with respiratory disease are most at risk. *Id.* EPA has further found that harmful hazardous air pollutants associated with natural gas, like formaldehyde and benzene, cause cancer and other adverse health effects. *Id.*

According to EPA, the 2016 Standard was expected to reduce 510,000 tons of methane, 210,000 tons of volatile organic compounds, and 3,900 tons of hazardous air pollutants in 2025 alone. 81 Fed. Reg. at 35,827. Between the health benefits of the rule and the increased revenues that operators would realize from recovering natural gas that would otherwise be released, EPA determined that the 2016 Standard would result in a net benefit estimated at $35 million in 2020 and $170 million in 2025. *Id.* at 35,827-28.

Importantly, EPA's promulgation of the 2016 Standard also triggered its statutory obligation to issue methane emission guidelines for existing sources in the oil and natural gas sector. *See* 42 U.S.C. § 7411(d); 40 C.F.R. § 60.22a(a). In November 2016, the agency began developing existing source guidelines by issuing an information collection request to obtain specific information from facilities to use in addressing existing source emissions. *See* 81 Fed. Reg. 35,763-64.

IV. EPA's Reversal on Regulating Methane from the Oil and Natural Gas Industry

In March 2017, EPA withdrew the existing source information request, abruptly halting its efforts to regulate existing sources without any notice or opportunity to comment. 82 Fed. Reg. 12,817 (Mar. 7, 2017). EPA then issued an administrative stay of the 2016 Standard, which this Court summarily vacated. *Clean Air Council v. Pruitt*, 862 F.3d 1, 14 (D.C. Cir. 2017). EPA signaled that it had no intention to implement the 2016 Standard and proposed two additional stays of the requirements, which EPA never finalized. 82 Fed. Reg. 27,641 (June 16, 2017); 82 Fed. Reg. 27,645 (June 16, 2017). In October 2018, EPA proposed technical amendments to the 2016 Standard, which EPA recently finalized separately. 85 Fed. Reg. 57,398 (Sept. 15, 2020).

The Rescission Rule is the final chapter in EPA's serial attempts to undermine a common-sense rule that reduces emissions of harmful pollutants and recovers valuable natural gas that would otherwise be lost. The Rescission Rule deregulates sources in the transmission and storage segment of the oil and natural gas sector, rescinds methane standards for the entire sector, and concludes that EPA lacks authority to regulate methane emissions from existing sources.

PROCEDURAL HISTORY

On September 14, 2020, State Petitioners, Petitioners Environmental Defense Fund et al. ("Environmental Petitioners"), and Petitioners Environmental Law and Policy Center filed separate petitions for review of the Rescission Rule, which this Court consolidated. On September 15, State Petitioners sent a letter to Administrator Wheeler requesting that he stay the Rescission Rule. Also on September 15, Environmental Petitioners filed an Emergency Motion for Stay, or in the alternative, for Summary Vacatur. On September 17, this Court ordered an administrative stay of the Rescission Rule pending consideration of all motions for stay. On September 17, counsel for the State of California informed opposing counsel that it would be seeking an emergency stay of the Rescission Rule.

LEGAL STANDARD

To obtain a judicial stay, State Petitioners must demonstrate: (a) likelihood of success on the merits; (b) that they are likely to suffer irreparable harm in the absence of injunctive relief; (c) that the balance of equities favors an injunction; and (d) that an injunction is in the public interest. *Winters v. Nat. Res. Def. Council, Inc*., 555 U.S. 7, 20 (2008). The final two factors "merge when the Government is the opposing party." *Nken v. Holder*, 556 U.S. 418, 435 (2009).

To obtain expedited consideration before this Court, State Petitioners must show good cause by demonstrating that "delay will cause irreparable injury" and "the decision under review is subject to substantial challenge." 28 U.S.C. § 1657(a); D.C. Cir. Handbook of Practice and Internal Procedures 34 (2019).

ARGUMENT

I. PETITIONERS ARE LIKELY TO SUCCEED ON THE MERITS BECAUSE THE RESCISSION RULE IS ARBITRARY AND CAPRICIOUS AND UNLAWFUL

Under the Clean Air Act, an EPA rulemaking must be set aside if it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 42 U.S.C. § 7607(d)(9)(A). "One of the basic procedural requirements of administrative rulemaking is that an agency must give adequate reasons for its decisions." *Encino Motorcars LLC v. Navarro*, 136 S. Ct. 2117, 2125 (2016); *see also Motor Vehicle Mfrs. Ass'n of the U. S. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).

EPA reverses previous legal positions in the Rescission Rule. Thus, to justify each reversal, EPA must show that "the new policy is permissible under the statute" and provide "good reasons" for it. *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009). Further, because the Rescission Rule rests upon factual findings that contradict a prior policy, EPA must include "a reasoned explanation…for disregarding facts and circumstances that underlay or were engendered by the prior policy." *Fox*, 556 U.S. at 515-16. Because EPA fails this standard, the Rescission Rule is arbitrary and capricious and unlawful under the Clean Air Act.

A. EPA's Removal of Transmission and Storage from the Source Category Is Unlawful and Arbitrary and Capricious

In the Rescission Rule, EPA unlawfully and without reasoned explanation entirely removes the transmission and storage segment from the oil and natural gas source category, completely deregulating components that are responsible for 21 percent of methane emissions from the oil and natural gas industry. 85 Fed. Reg. at 57,022. Perhaps realizing that increasing dangerous pollution would be difficult to justify as a reasoned exercise of discretion, EPA contrives an argument that it was *compelled* to do so under a new, untenable interpretation of its statutory authority. But EPA fails to grapple with the substantial record from the 2016 Standard demonstrating the reasonableness of regulating all segments of the oil and gas sector in one source category. EPA's novel interpretation of the Clean Air Act is unsupportable, and, even if it were colorable, does not supply a reasoned basis for EPA's reversal of its 2016 position.

Instead of providing "good reasons" for reversing its 2016 determination, *Fox*, 556 U.S. at 515, EPA claims it is "required" to treat the transmission and storage segment as its own source category, separate from the oil and natural gas source category, by creating a test that finds no basis in the statutory text.[2] In reality, nothing in section 111(b) compels the agency to rescind its prior determination. *See Dept. of Homeland Security v. Regents of Univ. of Cal.*, 140 S.Ct. 1891, 1912-13 (June 18, 2020) (finding agency's explanation that it was legally compelled to rescind prior policy arbitrary and capricious for failing to adequately evaluate legality of prior policy and failing to consider alternatives to total rescission).

[2] EPA asserts that segments within an industry must be "sufficiently related" in order to be grouped under one source category listing, a term that the agency acknowledges is not found in the Clean Air Act, but that the agency contends is "implicit in the everyday meaning of 'category.'" 85 Fed. Reg. at 57,027.

Even if EPA's newfound interpretation of the Clean Air Act was permissible, its application of its new test in this rulemaking is arbitrary and capricious. EPA states that sources must "have something in common" to be grouped under one source category, 85 Fed. Reg. at 57,027, but then brushes aside the many obvious and relevant commonalities between the transmission and storage segment and the production and processing segments. These commonalities were well-supported by the administrative record for the 2016 Standard and well-documented by commenters on the proposed Rescission Rule, including that all of these segments (i) use the same equipment, (ii) emit the same pollutants, and (iii) can be controlled by the same technologies and practices. *See* 81 Fed. Reg. 35,832; A332. Indeed, as detailed in Environmental Petitioners' Motion for Stay, EPA has broadly categorized sources since it began implementing section 111(b) in 1977, Motion at 12-14, and the segments at issue here are much more closely related than other segments EPA has reasonably chosen to regulate under one source category, *see, e.g.*, 40 C.F.R. § 60.100a (regulating disparate petroleum refinery sources, including those that are not physically located at refineries, that handle different gas compositions, and that are controlled with different technologies). The agency's failure to explain its inconsistent treatment of the oil and gas industry as compared to its historical treatment of many other industries, is arbitrary and capricious. *See ANR Storage Co. v. FERC*, 904 F.3d 1020, 1026 (D.C. Cir. 2018) (finding agency's conclusion arbitrary and capricious for its internally inconsistent treatment of regulated parties).

EPA also ignores the significant reliance interests engendered by four years of emissions controls on components in the transmission and storage segment for both states and local communities (facing unexpected increases in volatile organic compounds and hazardous air pollutants) and the regulated industry (facing sunk emission control costs for sources previously subject to the 2016 Standard). *See Dept. of Homeland Security*, 140 S.Ct. at 1913.

In sum, EPA has not provided any "reasoned explanation…for disregarding facts and circumstances that underlay" EPA's prior determination that the oil and natural gas source category includes the transmission and storage segment. *Fox*, 556 U.S. at 515-16. EPA's rollback of requirements for the transmission and storage segment is therefore arbitrary and capricious and shows that State Petitioners are likely to succeed on their claims that the Rescission Rule is invalid.

B. EPA's Rescission of the Methane Regulations Is Unlawful and Arbitrary and Capricious

EPA's wholesale rescission of the remaining methane controls on the production and processing segment fares no better. EPA attempts to justify its decision by arguing that: (1) EPA failed to use "established criteria" in 2016 for judging the significance of methane emissions from the oil and natural gas source category, even though EPA had never done so before for any source category and even today cannot say what those criteria are; (2) EPA's 2016 determination that methane emissions from the source category significantly contributed to dangerous pollution is invalid because EPA did not ignore emissions from the transmission and storage segment; and (3) the methane requirements provide no additional benefits and impose no additional costs compared to the requirements for volatile organic compounds, even though they trigger regulation of existing sources. These flawed justifications fail to provide the requisite reasoned explanations for its complete about face.

1. EPA's retroactive requirement that it employ unspecified significance criteria does not provide a reasoned explanation and creates unexplained inconsistencies.

EPA claims its 2016 significance finding was invalid because EPA did not employ "some type of (reasonably explained and intelligible) standard and/or established set of criteria" in making that finding. 85 Fed. Reg. at 57,038; *see also id.* at 57,019.[3] EPA's justification is arbitrary and capricious in that it fails to recognize and justify the inconsistency created by its retroactive application of this

[3] In the Rescission Rule, EPA issued a new interpretation of section 111(b)(1)(A), declaring that EPA may not regulate an additional air pollutant for an already-listed source category without determining that emissions of *that* air pollutant from *that* source category cause or contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. The Court need not address this issue to determine State Petitioners' likelihood of success on the merits because, even if that particular finding was required, EPA concedes that it made it in 2016.

new requirement to the 2016 listing and not to the 1979 listing, nor to any other source category regulated under section 111(b) in the last 50 years.

While EPA fully explained in 2016 why it determined that methane from these sources contributes significantly to dangerous air pollution, 81 Fed. Reg. at 35,839-41, EPA now deems that explanation inadequate, not based on any substantive reexamination of the science or the record, but rather because the Agency did not apply a "standard" or "established set of criteria." 85 Fed. Reg. at 57,038. But even today, EPA is unable to articulate what criteria it says it was obligated to apply in 2016.

EPA completely fails to explain the inconsistency of its current position with its listings over the past 50 years. *See Physicians for Soc. Responsibility v. Wheeler*, 956 F.3d 634, 644 (D.C. Cir. 2020) ("[W]hen departing from precedents or practices, an agency must 'offer a reason to distinguish them or explain its apparent rejection of their approach.'") (quoting *Sw. Airlines Co. v. FERC*, 926 F.3d 851, 856 (D.C. Cir. 2019)). EPA's past practice has never required the agency to first develop and then apply specific standards or criteria to constrain its judgment as to which sources and pollutants can be regulated under section 111(b). For example, the original 1979 listing for the oil and natural gas source category—which EPA now asserts is the only valid one—also addressed 58 other diverse source categories, including Synthetic Organic Chemical Manufacturing, Plywood

Manufacture, Asphalt Roofing Plants, Dry Cleaning, and Uranium Refining. In a five-page Federal Register notice, EPA announced, as to all 59 categories collectively:

> Promulgation of this list . . . constitutes notice that all source categories on the priority list are considered significant sources of air pollution and are hereby listed in accordance with section 111(b)(1)(A).

44 Fed. Reg. at 49,225. The 1979 listing does not apply, or even imply, a "standard or established set of criteria" for any of the 59 source categories; nor does it discuss a single pollutant to be regulated. The 1985 standards for volatile organic compound emissions from these sources similarly does not apply EPA's new test. Rather, EPA issued these standards based on the fundamental and self-explanatory finding required by section 111(b)(1)(A): "the Administrator's determination that emissions from the [source category] cause, or contribute significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare." 50 Fed. Reg. at 26,122.

In neither the proposed nor final Rescission Rule did EPA provide a single example of a standard issued under section 111(b) that it previously issued using a "standard or established set of criteria" it now demands. EPA's application of its new constraint only to the 2016 significance finding for methane is thus the very definition of arbitrary. *Nat'l Cable & Telecomms. Ass'n v. Brand X Internet Servs.*, 545 U.S. 967, 981 (2005) ("Unexplained inconsistency" in agency policy is "a reason for holding an interpretation to be an arbitrary and capricious change from agency practice.”). Indeed, a comparison of the 1979 listing for this source category and the 2016 pollutant-and-source-category-specific finding for methane shows that it is actually the 2016 listing that explicitly analyzes the quantity and harms of pollution emitted by these sources.

EPA has articulated no rational basis for singling out the 2016 Standard for repeal based on its alleged failure to apply criteria that are not even known to EPA itself. *Encino Motorcars*, 136 S. Ct. at 2125 (“[A]n agency must give adequate reasons for its decisions.”).

2. EPA arbitrarily divides the source category to justify ignoring emissions from the transmission and storage segment.

EPA also claims the rescission of methane standards is required because, when it determined in 2016 that methane emissions from the oil and natural gas source category contribute significantly to endangerment, it included emissions from the transmission and storage segment instead of ignoring them. For the reasons stated above, EPA’s removal of the transmission and storage segments from the source category is unlawful. *See supra* I.A.

Further, given its factual determinations in 2016, EPA is no longer writing on a blank slate. The Rescission Rule does not contend that the oil and natural gas source category does not significantly contribute to the emission of greenhouse gases like methane. EPA does not explain how the inclusion or exclusion of transmission and storage segments affects the agency's 2016 significant contribution finding. Indeed, the bulk of emissions from the source category come from the segments that EPA has retained, with only 21 percent being emitted from the now-excluded transmission and storage segments. EPA has merely announced a policy of non-regulation while disregarding the record and factual findings before it. Accordingly, EPA's rescission of methane standards is arbitrary and capricious.

3. EPA's redundancy rationale is legally baseless and arbitrary and capricious.

Nor can EPA justify its rescission of methane standards by claiming they are "redundant" of the remaining standards for volatile organic compounds. 85 Fed. Reg. at 57,019. As EPA admits, the Clean Air Act does not "explicitly authorize[] rescinding requirements on the ground that they are redundant." *Id*. at 57,049. In fact, while the industry currently controls these pollutants via the same technology and processes, EPA admits that in the future, control technologies, and thus the performance standards based on the capabilities of those technologies, could diverge. *Id*. at 57,049; *see also* A387-388. Further, removing methane from the 2016 Standard means that the methane requirements will not be subject to periodic mandatory review under section 111(b)(1)(B) of the Clean Air Act and possible revisions to reflect those changing realities. It is thus arbitrary and capricious to remove methane controls on the basis of some claimed near-term redundancy when, as EPA admits, that redundancy may not last.

Critically, EPA's feeble rationale circumvents another significant—and patently intentional—consequence of its action: By rescinding methane standards for all new sources in the oil and natural gas sector, EPA claims that it is no longer statutorily obligated to promulgate emission guidelines for the more than 850,000 existing sources of methane nationwide. Methane emissions from existing oil and natural gas sources constitute the majority of methane emissions from the oil and natural gas sector in the United States and yet EPA declines to assess those impacts. *See* 85 Fed. Reg. at 57,033; *see also* Env'tl Petitioners' Motion at A0086-0087 (estimating 43.6 million metric tons of methane have been emitted from existing oil and natural gas sources since 2016). EPA's assertion that the new source methane standards are entirely redundant fails to consider this significant, entirely non-redundant direct effect of the Rescission Rule.

In sum, EPA's redundancy rationale does not supply the requisite "good reasons" for the Rescission Rule and indeed amounts to "an explanation for its decision that runs counter to the evidence before the agency." *North Carolina v. EPA*, 531 F.3d 896, 906 (D.C. Cir. 2008) (quoting *State Farm*, 463 U.S. at 43).

II. STATE PETITIONERS ARE BEING IRREPARABLY HARMED BY THE RESCISSION RULE

With each passing day, the Rescission Rule adversely impacts public health and the environment. Environmental injury, by its nature, can seldom be adequately remedied by money damages and is often permanent or at least of long duration, i.e., irreparable. "If such injury is sufficiently likely, therefore, the balance of harms will usually favor the issuance of an injunction to protect the environment." *Amoco Prod. Co. v. Village of Gambell*, 480 U.S. 531, 545 (1987).

By EPA's removal of the transmission and storage segment from all regulatory requirements, owners and operators of these sources are no longer subject to any emission controls under section 111. As EPA admits, effective immediately, the Rescission Rule will thus increase emissions of volatile organic compounds (which are a precursor to ozone) and hazardous air pollutants, which "degrade air quality and adversely affect health and welfare." 85 Fed. Reg. at 57,020.

This increase in volatile organic compounds—and hence ozone—from the Rescission Rule is particularly significant for states like New Mexico that do not currently have state standards and rely on federal regulation of oil and natural gas sources. New Mexico is the third largest oil producing state in the United States. A027, ¶ 7. Ozone concentrations have increased throughout New Mexico to within five percent of federal ambient air quality standards as a result of volatile organic compounds emitted by New Mexico's own oil and natural gas production and from interstate transport emissions from the Permian Basin in Texas. A028-029, ¶¶ 8-10, 13. The Rescission Rule will substantially and directly impede New Mexico's efforts to implement ozone control measures and keep its counties in attainment with the ozone national ambient air quality standards. A028-029, ¶¶ 9, 10, 12. Exceeding ozone standards may result in a nonattainment status designation under section 107(d) of the Clean Air Act, which carries potentially serious sanctions and damaging repercussions for New Mexico, including the loss of federal highway funding and economic development opportunities. A030, ¶¶ 14-15.

Further, by deregulating transmission and storage sources and removing the statutory trigger to regulate existing sources, the Rescission Rule will significantly increase methane emissions throughout the country. Methane is a potent greenhouse gas that warms the earth much faster than carbon dioxide, so efforts to reduce methane emissions can have an immediate beneficial effect. *See* A181. But instead of charting a path toward climate stabilization, the Rescission Rule reverses progress by *increasing* methane emissions, thereby contributing to climate change and harming State Petitioners. State Petitioners have experienced and will continue to experience substantial injuries from climate change-driven events and conditions. *See* A001-069. These injuries include destructive wildfires, droughts, sea level rise, damaging floods, and increased deaths and illnesses due to intensified and prolonged heat waves. *See e.g.* A003-006 (detailing climate change impacts on California's beaches, cultural resources, and forests); A056-057 (quantifying Oregon's direct and indirect costs for wildfire suppression); A064-066 (detailing economic impact of ocean acidification on Washington's shellfish industry); A012-018 (describing impact of sea level rise on Massachusetts's coastal resources and communities).

In light of these irreparable and immediate injuries, State Petitioners have demonstrated strongly compelling reasons for a stay or, in the alternative, expedited briefing. *See* D.C. Cir. Handbook 34.

III. The Public Interest and Balance of Equities Support the Issuance of a Stay

"In exercising their sound discretion, courts of equity should pay particular regard for the public consequences" when issuing an injunction. *Winters*, 555 U.S. at 24. Here, the public benefits of staying the Rescission Rule far outweigh any harm that may occur to EPA and oil and natural gas companies from keeping the current regulatory requirements in effect pending litigation.

As stated, the Rescission Rule will result in an increase in air pollution that contributes to climate change—specifically from sources within the transmission and storage segment—previously subject to the 2016 Standard, with significant repercussions for public health and welfare and economic wellbeing. Indeed, EPA concluded the climate benefits of the 2016 Standard outweighed costs by $170 million in 2025 alone. *See* 81 Fed. Reg. at 35,828, 35,886, 35,889. And lost methane emissions also result in lost revenue for producing states and industry. Every ton of methane leaked to the atmosphere is a ton of methane that is wasted, and for producing states, may result in lost tax and royalty benefits.

By contrast, the costs to EPA and oil and natural gas companies are minimal. These regulations have been in place for years, and companies have invested in complying with the technically feasible, cost effective standards. The balance of equities of the parties and the public interest as a whole therefore overwhelmingly favor a judicial stay of the Rescission Rule.

CONCLUSION

Given the likelihood of success on the merits, the irreparable harm posed by the Rescission Rule, and all the reasons provided herein, State Petitioners respectfully request that the Court grant State Petitioners' motion for judicial stay of EPA's unlawful Rescission Rule. In the alternative, State Petitioners request expedited briefing and consideration of the case.

Dated: Sept. 18, 2020

Respectfully Submitted,

FOR THE STATE OF CALIFORNIA

XAVIER BECERRA
Attorney General of California
ROBERT BYRNE
EDWARD H. OCHOA
Senior Assistant Attorneys General
GARY E. TAVETIAN
DAVID A. ZONANA
Supervising Deputy Attorneys General
TIMOTHY E. SULLIVAN
KAVITA LESSER
CAITLAN MCLOON
Deputy Attorneys General

/s/ Meredith J. Hankins
MEREDITH J. HANKINS
Deputy Attorney General
300 South Spring Street, Suite 1702
Los Angeles, CA 90013
Tel: (213) 269-6177
Meredith.Hankins@doj.ca.gov

Attorneys for Petitioner State of California, by and through its Attorney General Xavier Becerra, and California Air Resources Board

FOR THE STATE OF COLORADO

PHILIP J. WEISER
Attorney General
ERIC R. OLSON
Solicitor General
SCOTT STEINBRECHER
Assistant Deputy Attorney General
Natural Resources and Environment
Section

/s/ Eric R. Olson
ERIC R. OLSON
Solicitor General
Colorado Department of Law
1300 Broadway, 10th Floor
Denver, Colorado 80203
Tel: (720) 508-6548
Eric.Olson@coag.gov

Attorneys for Petitioner State of Colorado, by and through its Attorney General Philip J. Weiser, and Colorado Department of Public Health and Environment

FOR THE STATE OF CONNECTICUT

WILLIAM TONG
Attorney General

/s/ Jill Lacedonia
JILL LACEDONIA
Assistant Attorney General
Connecticut Office of the Attorney General
165 Capitol Avenue
Hartford, CT 06106
Tel: (860) 808-5250
Jill.Lacedonia@ct.gov

Attorneys for Petitioner State of Connecticut

FOR THE STATE OF DELAWARE

KATHLEEN JENNINGS
Attorney General

/s/ Christian Douglas Wright
CHRISTIAN DOUGLAS WRIGHT
Director of Impact Litigation
VALERIE EDGE
Deputy Attorney General
JAMESON A.L. TWEEDIE*
Special Assistant Deputy Attorney General
Delaware Department of Justice
820 N. French Street
Wilmington, DE 19801
Tel: (302) 577-8600
Christian.Wright@delaware.gov
Valerie.Edge@delaware.gov
Jameson.Tweedie@delaware.gov

Attorneys for Petitioner State of Delaware

*Not yet admitted to the Bar of this Court

FOR THE STATE OF ILLINOIS

KWAME RAOUL
Attorney General
MATTHEW J. DUNN
Chief, Environmental Enforcement/Asbestos Litigation Division

/s/ Daniel I. Rottenberg
DANIEL I. ROTTENBERG
JASON E. JAMES
Assistant Attorneys General
69 W. Washington Street, 18th Floor
Chicago, IL 60602
Tel: (312) 814-3816
drottenberg@atg.state.il.us

Attorneys for Petitioner State of Illinois

FOR THE STATE OF MAINE

AARON M. FREY
Attorney General

/s/ Laura E. Jensen
LAURA E. JENSEN
Assistant Attorney General
Office of the Attorney General
6 State House Station
Augusta, ME 04333
Tel: (207) 626-8868
Laura.Jensen@maine.gov

Attorneys for Petitioner State of Maine

FOR THE STATE OF MARYLAND

BRIAN E. FROSH
Attorney General

/s/ Joshua M. Segal
JOSHUA M. SEGAL
Special Assistant Attorney General
200 St. Paul Place
Baltimore, MD 21202
Tel: (410) 576-6446
jsegal@oag.state.md.us

Attorneys for Petitioner State of Maryland

FOR THE COMMONWEALTH OF MASSACHUSETTS

MAURA HEALEY
Attorney General

/s/ Melissa Hoffer
MELISSA HOFFER
Chief, Energy and Environment Bureau
Office of the Attorney General
One Ashburton Place, 18th Floor
Boston, MA 02108
Tel: (617) 727-2200
Melissa.Hoffer@mass.gov

Attorneys for Petitioner Commonwealth of Massachusetts

FOR THE PEOPLE OF THE STATE OF MICHIGAN

DANA NESSEL
Attorney General

/s/ Elizabeth Morrisseau
ELIZABETH MORRISSEAU
Assistant Attorney General
Environment, Natural Resources, and Agriculture Division 6th Floor
G. Mennen Williams Building
525 W. Ottawa Street
P.O. Box 30755
Lansing, MI 48909
Tel: (517) 335-7664
MorrisseauE@michigan.gov

Attorneys for Petitioner People of the State of Michigan

FOR THE STATE OF MINNESOTA

KEITH ELLISON
Attorney General of Minnesota

/s/ Peter N. Surdo
PETER N. SURDO
Special Assistant Attorney General
445 Minnesota Street Suite 900
Saint Paul, MN 55101
Tel: (651) 757-1061
Peter.Surdo@ag.state.mn.us

Attorneys for Petitioner State of Minnesota

FOR THE STATE OF NEW JERSEY

GURBIR S. GREWAL
Attorney General

/s/ Lisa Morelli
LISA MORELLI
Deputy Attorney General
25 Market St., PO Box 093
Trenton, NJ 08625-0093
Tel: (609) 376-2745
Lisa.Morelli@law.njoag.gov

Attorneys for Petitioner State of New Jersey

FOR THE STATE OF NEW MEXICO

HECTOR BALDERAS
Attorney General of New Mexico

/s/ William Grantham
WILLIAM GRANTHAM
Assistant Attorney General
201 Third Street NW, Suite 300
Albuquerque, New Mexico 87102
Tel: (505) 717-3520
wgrantham@nmag.gov

Attorneys for Petitioner State of New Mexico

FOR THE STATE OF NEW YORK

LETITIA JAMES
Attorney General
BARBARA D. UNDERWOOD
Solicitor General
STEVEN C. WU
Deputy Solicitor General

/s/ Morgan A. Costello
MORGAN A. COSTELLO
MICHAEL J. MYERS
Assistant Attorneys General
Office of the Attorney General
The Capitol
Albany, NY 12224
Tel: (518) 776-2392
morgan.costello@ag.ny.gov

Attorneys for Petitioner State of New York

FOR THE STATE OF NORTH CAROLINA

JOSHUA H. STEIN
Attorney General
DANIEL S. HIRSCHMAN
Senior Deputy Attorney General

/s/ Asher P. Spiller
ASHER P. SPILLER
TAYLOR H. CRABTREE
Assistant Attorneys General
North Carolina Department of Justice
P.O. Box 629
Raleigh, NC 27602
Tel: (919) 716-6400
aspiller@ncdoj.gov
tcrabtree@ncdoj.gov

Attorneys for Petitioner State of North Carolina

FOR THE STATE OF OREGON

ELLEN F. ROSENBLUM
Attorney General

/s/ Paul Garrahan
PAUL GARRAHAN
Attorney-in-Charge
STEVE NOVICK
Special Assistant Attorney General
Natural Resources Section
Oregon Department of Justice
1162 Court Street NE
Salem, OR 97301-4096
Tel: (503) 947-4593
Paul.Garrahan@doj.state.or.us
Steve.Novick@doj.state.or.us

Attorneys for Petitioner State of Oregon

FOR THE COMMONWEALTH OF PENNSYLVANIA

JOSH SHAPIRO
Attorney General
MICHAEL J. FISCHER
Chief Deputy Attorney General

/s/ Ann R. Johnston
ANN R. JOHNSTON
Senior Deputy Attorney General
Office of Attorney General
1600 Arch St. Suite 300
Philadelphia, PA 19103
Tel: (215) 560-2171
ajohnston@attorneygeneral.gov

Attorneys for Petitioner Commonwealth of Pennsylvania

FOR THE STATE OF RHODE ISLAND

PETER F. NERONHA
Attorney General

/s/ Gregory S. Schultz
GREGORY S. SCHULTZ
Special Assistant Attorney General
Rhode Island Office of Attorney General
150 South Main Street
Providence, RI 02903
Tel: (401) 274-4400
gschultz@riag.ri.gov

Attorneys for Petitioner State of Rhode Island

FOR THE STATE OF VERMONT

THOMAS J. DONOVAN, JR.
Attorney General

/s/ Nicholas F. Persampieri
NICHOLAS F. PERSAMPIERI
Assistant Attorney General
Office of the Attorney General
109 State Street
Montpelier, VT 05609
Tel: (802) 828-3171
nick.persampieri@vermont.gov

Attorneys for Petitioner State of Vermont

FOR THE COMMONWEALTH OF VIRGINIA

MARK R. HERRING
Attorney General
PAUL KUGELMAN, JR.
Senior Assistant Attorney General
Chief, Environmental Section

/s/ Caitlin C. G. O'Dwyer
CAITLIN C. G. O'DWYER
Assistant Attorney General
Office of the Attorney General
Commonwealth of Virginia
202 North 9th Street
Richmond, VA 23219
Tel: (804) 786-1780
godwyer@oag.state.va.us

Attorneys for Petitioner Commonwealth of Virginia

FOR THE STATE OF WASHINGTON

ROBERT W. FERGUSON
Attorney General

/s/ Emily C. Nelson
EMILY C. NELSON
Assistant Attorney General
Office of the Attorney General
P.O. Box 40117
Olympia, WA 98504
Tel: (360) 586-4507
emily.nelson@atg.wa.gov

Attorneys for Petitioner State of Washington

FOR THE DISTRICT OF COLUMBIA

KARL A. RACINE
Attorney General

/s/ Loren L. AliKhan
LOREN L. ALIKHAN
Solicitor General
Office of the Attorney General
400 Sixth Street, NW, Ste. 8100
Washington, D.C. 20001
Tel: (202) 727-6287
Loren.Alikhan@dc.gov

Attorneys for Petitioner District of Columbia

FOR THE CITY OF CHICAGO

MARK A. FLESSNER
Corporation Counsel

/s/ Benna Ruth Solomon
BENNA RUTH SOLOMON
Deputy Corporation Counsel
JARED POLICICCHIO
Supervising Assistant Corporation Counsel
30 N. LaSalle Street, S. 800
Chicago, IL 60602
Tel: (312) 744-7764
Benna.Solomon@cityofchicago.org
Jared.Policicchio@cityofchicago.org

Attorneys for Petitioner City of Chicago

FOR THE CITY AND COUNTY OF DENVER

KRISTIN M. BRONSON
City Attorney

/s/ Edward J. Gorman
EDWARD J. GORMAN
LINDSAY S. CARDER
Assistant City Attorneys
Denver City Attorney's Office
201 W. Colfax Avenue, Dept. 1207
Denver, Colorado 80202
Tel: (720) 913-3275
Edward.Gorman@denvergov.org

Attorneys for Petitioner City and County of Denver

CERTIFICATE OF COMPLIANCE

Pursuant to Federal Rules of Appellate Procedure 27(d) and D.C. Circuit Rule 27(a)(2), I hereby certify that the foregoing complies with all applicable format and length requirements, and contains 5,196 words as calculated by Microsoft Word, exclusive of the caption, signature block, and certificates of counsel.

/s/ Meredith J. Hankins
MEREDITH J. HANKINS

CERTIFICATE OF SERVICE

Pursuant to Federal Rule of Appellate Procedure 25(c), I hereby certify that the foregoing was electronically filed with the Clerk of the Court using the CM/ECF system, which automatically sends a notification to the attorneys of record in this matter, who are registered with the Court's CM/ECF system.

/s/ Meredith J. Hankins
MEREDITH J. HANKINS

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

STATE OF CALIFORNIA, *et al.* Petitioners, v. ANDREW R. WHEELER, in his official capacity as Administrator, United States Environmental Protection Agency; UNITED STATES ENVIRONMENTAL PROTECTION AGENCY Respondents.	No. 20-1357 *Consolidated with Nos. 20-1359 and 20-1363*

ATTACHMENTS IN SUPPORT OF EMERGENCY MOTION FOR STAY PENDING REVIEW

TABLE OF CONTENTS

Dated: Sept. 18, 2020

Respectfully Submitted,

FOR THE STATE OF CALIFORNIA

XAVIER BECERRA
Attorney General of California
ROBERT BYRNE
EDWARD H. OCHOA
Senior Assistant Attorneys General
GARY E. TAVETIAN
DAVID A. ZONANA
Supervising Deputy Attorneys General
TIMOTHY E. SULLIVAN
KAVITA LESSER
CAITLAN MCLOON
Deputy Attorneys General

/s/ Meredith J. Hankins
MEREDITH J. HANKINS
Deputy Attorney General
300 South Spring Street, Suite 1702
Los Angeles, CA 90013
Tel: (213) 269-6177
Meredith.Hankins@doj.ca.gov

Attorneys for Petitioner State of California, by and through its Attorney General Xavier Becerra, and California Air Resources Board

FOR THE STATE OF COLORADO

PHILIP J. WEISER
Attorney General
ERIC R. OLSON
Solicitor General
SCOTT STEINBRECHER
Assistant Deputy Attorney General
Natural Resources and Environment
Section

/s/ Eric R. Olson
ERIC R. OLSON
Solicitor General
Colorado Department of Law
1300 Broadway, 10th Floor
Denver, Colorado 80203
Tel: (720) 508-6548
Eric.Olson@coag.gov

Attorneys for Petitioner State of Colorado, by and through its Attorney General Philip J. Weiser, and Colorado Department of Public Health and Environment

FOR THE STATE OF CONNECTICUT

WILLIAM TONG
Attorney General

/s/ Jill Lacedonia
JILL LACEDONIA
Assistant Attorney General
Connecticut Office of the Attorney General
165 Capitol Avenue
Hartford, CT 06106
Tel: (860) 808-5250
Jill.Lacedonia@ct.gov

Attorneys for Petitioner State of Connecticut

FOR THE STATE OF DELAWARE

KATHLEEN JENNINGS
Attorney General

<u>*/s/ Christian Douglas Wright*</u>
CHRISTIAN DOUGLAS WRIGHT
Director of Impact Litigation
VALERIE EDGE
Deputy Attorney General
JAMESON A.L. TWEEDIE*
Special Assistant Deputy Attorney General
Delaware Department of Justice
820 N. French Street
Wilmington, DE 19801
Tel: (302) 577-8600
Christian.Wright@delaware.gov
Valerie.Edge@delaware.gov
Jameson.Tweedie@delaware.gov

Attorneys for Petitioner State of Delaware

*Not yet admitted to the Bar of this Court

FOR THE STATE OF ILLINOIS

KWAME RAOUL
Attorney General
MATTHEW J. DUNN
Chief, Environmental Enforcement/Asbestos Litigation Division

<u>*/s/ Daniel I. Rottenberg*</u>
DANIEL I. ROTTENBERG
JASON E. JAMES
Assistant Attorneys General
69 W. Washington Street, 18th Floor
Chicago, IL 60602
Tel: (312) 814-3816
drottenberg@atg.state.il.us

Attorneys for Petitioner State of Illinois

FOR THE STATE OF MAINE

AARON M. FREY
Attorney General

<u>*/s/ Laura E. Jensen*</u>
LAURA E. JENSEN
Assistant Attorney General
Office of the Attorney General
6 State House Station
Augusta, ME 04333
Tel: (207) 626-8868
Laura.Jensen@maine.gov

Attorneys for Petitioner State of Maine

FOR THE STATE OF MARYLAND

BRIAN E. FROSH
Attorney General

<u>*/s/ Joshua M. Segal*</u>
JOSHUA M. SEGAL
Special Assistant Attorney General
200 St. Paul Place
Baltimore, MD 21202
Tel: (410) 576-6446
jsegal@oag.state.md.us

Attorneys for Petitioner State of Maryland

FOR THE COMMONWEALTH OF MASSACHUSETTS

MAURA HEALEY
Attorney General

<u>*/s/ Melissa Hoffer*</u>
MELISSA HOFFER
Chief, Energy and Environment Bureau
Office of the Attorney General
One Ashburton Place, 18th Floor
Boston, MA 02108
Tel: (617) 727-2200
Melissa.Hoffer@mass.gov

Attorneys for Petitioner Commonwealth of Massachusetts

FOR THE PEOPLE OF THE STATE OF MICHIGAN

DANA NESSEL
Attorney General

<u>*/s/ Elizabeth Morrisseau*</u>
ELIZABETH MORRISSEAU
Assistant Attorney General
Environment, Natural Resources, and Agriculture Division 6th Floor
G. Mennen Williams Building
525 W. Ottawa Street
P.O. Box 30755
Lansing, MI 48909
Tel: (517) 335-7664
MorrisseauE@michigan.gov

Attorneys for Petitioner People of the State of Michigan

FOR THE STATE OF MINNESOTA

KEITH ELLISON
Attorney General of Minnesota

<u>*/s/ Peter N. Surdo*</u>
PETER N. SURDO
Special Assistant Attorney General
445 Minnesota Street Suite 900
Saint Paul, MN 55101
Tel: (651) 757-1061
Peter.Surdo@ag.state.mn.us

Attorneys for Petitioner State of Minnesota

FOR THE STATE OF NEW JERSEY

GURBIR S. GREWAL
Attorney General

/s/ Lisa Morelli
LISA MORELLI
Deputy Attorney General
25 Market St., PO Box 093
Trenton, NJ 08625-0093
Tel: (609) 376-2745
Lisa.Morelli@law.njoag.gov

Attorneys for Petitioner State of New Jersey

FOR THE STATE OF NEW YORK

LETITIA JAMES
Attorney General
BARBARA D. UNDERWOOD
Solicitor General
STEVEN C. WU
Deputy Solicitor General

/s/ Morgan A. Costello
MORGAN A. COSTELLO
MICHAEL J. MYERS
Assistant Attorneys General
Office of the Attorney General
The Capitol
Albany, NY 12224
Tel: (518) 776-2392
morgan.costello@ag.ny.gov

Attorneys for Petitioner State of New York

FOR THE STATE OF NEW MEXICO

HECTOR BALDERAS
Attorney General of New Mexico

/s/ William Grantham
WILLIAM GRANTHAM
Assistant Attorney General
201 Third Street NW, Suite 300
Albuquerque, New Mexico 87102
Tel: (505) 717-3520
wgrantham@nmag.gov

Attorneys for Petitioner State of New Mexico

FOR THE STATE OF NORTH CAROLINA

JOSHUA H. STEIN
Attorney General
DANIEL S. HIRSCHMAN
Senior Deputy Attorney General

/s/ Asher P. Spiller
ASHER P. SPILLER
TAYLOR H. CRABTREE
Assistant Attorneys General
North Carolina Department of Justice
P.O. Box 629
Raleigh, NC 27602
Tel: (919) 716-6400
aspiller@ncdoj.gov
tcrabtree@ncdoj.gov

Attorneys for Petitioner State of North Carolina

FOR THE STATE OF OREGON

ELLEN F. ROSENBLUM
Attorney General

/s/ Paul Garrahan
PAUL GARRAHAN
Attorney-in-Charge
STEVE NOVICK
Special Assistant Attorney General
Natural Resources Section
Oregon Department of Justice
1162 Court Street NE
Salem, OR 97301-4096
Tel: (503) 947-4593
Paul.Garrahan@doj.state.or.us
Steve.Novick@doj.state.or.us

Attorneys for Petitioner State of Oregon

FOR THE COMMONWEALTH OF PENNSYLVANIA

JOSH SHAPIRO
Attorney General
MICHAEL J. FISCHER
Chief Deputy Attorney General

/s/ Ann R. Johnston
ANN R. JOHNSTON
Senior Deputy Attorney General
Office of Attorney General
1600 Arch St. Suite 300
Philadelphia, PA 19103
Tel: (215) 560-2171
ajohnston@attorneygeneral.gov

Attorneys for Petitioner Commonwealth of Pennsylvania

FOR THE STATE OF RHODE ISLAND

PETER F. NERONHA
Attorney General

/s/ Gregory S. Schultz
GREGORY S. SCHULTZ
Special Assistant Attorney General
Rhode Island Office of Attorney General
150 South Main Street
Providence, RI 02903
Tel: (401) 274-4400
gschultz@riag.ri.gov

Attorneys for Petitioner State of Rhode Island

FOR THE STATE OF VERMONT

THOMAS J. DONOVAN, JR.
Attorney General

/s/ Nicholas F. Persampieri
NICHOLAS F. PERSAMPIERI
Assistant Attorney General
Office of the Attorney General
109 State Street
Montpelier, VT 05609
Tel: (802) 828-3171
nick.persampieri@vermont.gov

Attorneys for Petitioner State of Vermont

FOR THE COMMONWEALTH OF VIRGINIA

MARK R. HERRING
Attorney General
PAUL KUGELMAN, JR.
Senior Assistant Attorney General
Chief, Environmental Section

/s/ Caitlin C. G. O'Dwyer
CAITLIN C. G. O'DWYER
Assistant Attorney General
Office of the Attorney General
Commonwealth of Virginia
202 North 9th Street
Richmond, VA 23219
Tel: (804) 786-1780
godwyer@oag.state.va.us

Attorneys for Petitioner Commonwealth of Virginia

FOR THE STATE OF WASHINGTON

ROBERT W. FERGUSON
Attorney General

/s/ Emily C. Nelson
EMILY C. NELSON
Assistant Attorney General
Office of the Attorney General
P.O. Box 40117
Olympia, WA 98504
Tel: (360) 586-4507
emily.nelson@atg.wa.gov

Attorneys for Petitioner State of Washington

FOR THE CITY OF CHICAGO

MARK A. FLESSNER
Corporation Counsel

/s/ Benna Ruth Solomon
BENNA RUTH SOLOMON
Deputy Corporation Counsel
JARED POLICICCHIO
Supervising Assistant Corporation Counsel
30 N. LaSalle Street, S. 800
Chicago, IL 60602
Tel: (312) 744-7764
Benna.Solomon@cityofchicago.org
Jared.Policicchio@cityofchicago.org

Attorneys for Petitioner City of Chicago

FOR THE CITY AND COUNTY OF DENVER

KRISTIN M. BRONSON
City Attorney

/s/ Edward J. Gorman
EDWARD J. GORMAN
LINDSAY S. CARDER
Assistant City Attorneys
Denver City Attorney's Office
201 W. Colfax Avenue, Dept. 1207
Denver, Colorado 80202
Tel: (720) 913-3275
Edward.Gorman@denvergov.org

Attorneys for Petitioner City and County of Denver

FOR THE DISTRICT OF COLUMBIA

KARL A. RACINE
Attorney General

/s/ Loren L. AliKhan
LOREN L. ALIKHAN
Solicitor General
Office of the Attorney General
400 Sixth Street, NW, Ste. 8100
Washington, D.C. 20001
Tel: (202) 727-6287
Loren.Alikhan@dc.gov

Attorneys for Petitioner District of Columbia

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

STATE OF CALIFORNIA, *et al.*, *Petitioners*, v. ANDREW R. WHEELER, in his official capacity as Administrator, United States Environmental Protection Agency, *et al.*, *Respondents*.	No. 20-1357 (and consolidated cases)

DECLARATION OF JAY CHAMBERLIN

I, Jay Chamberlin, state and declare as follows:

1. I submit this declaration in support of the State Petitioners' challenge to the final action of the United States Environmental Protection Agency entitled "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review," published at 85 Fed. Reg. 57,018 (September 14, 2020) (Rescission Rule). I make this declaration of my own personal knowledge, unless otherwise indicated.

2. I am the Chief of the Natural Resources Division of the California Department of Parks and Recreation ("DPR"), a position I have held since 2010. I have worked in the conservation field for more than 20 years. I received a Masters of Science in Natural Resources and Environment from the University of Michigan in 1998. Prior to my current position, I served as Environmental Program Manager at the California Department of Water Resources from 2008 to 2010, and Deputy Assistant Secretary at the California Natural Resources Agency from 2005 to 2008. I have also worked as a consultant to the Ecosystem Restoration Program for

the California Bay-Delta Authority, and as Policy Manager for the Pacific Forest Trust, where my work focused on climate projects and policies.

3. I regularly give presentations on climate change and its impacts to the California State Park System, and on plans, management practices, and policies for addressing those impacts. I have given such presentations to professionals, students and other audiences, including, for example, the California State Assembly's Select Committee on Sea Level Rise and the California Economy. I have also given a series of climate change presentations and updates (in January 2018, September 2018, and May 2019) to the California State Parks and Recreation Commission, the body with authority for guiding policy and planning for the State Park System.

4. DPR manages the California State Park System, which consists of 280 park units and approximately 1.6 million acres of land. Parks are located in every bioregion of California, and the State Park System protects some of the most important natural resources in California, including old growth forests, grasslands, woodlands, lakes and reservoirs, habitat for native and rare wildlife, and roughly one-quarter of the California coastline. The State Park System also protects the largest assemblage of cultural resources in California, including historic buildings and archaeological sites. The State Park System receives in excess of 80,000,000 visitors per year, and it is the primary destination for shoreline recreation in California.

5. I am familiar with scientific studies and models related to global climate change and with evidence of the influence that climate change is having on resources in the State Park System. My knowledge is based on my ongoing review of the current scientific literature, attendance and participation at professional conferences, trainings, and workshops, and my work for DPR. Scientific models of global climate change – which link the buildup of Greenhouse

Gases (GHGs) to increased global temperatures – predict that by the year 2100 the average annual maximum daily temperature in California will increase by 5.6 to 8.8 degrees Fahrenheit.

6. For years, DPR staff have been engaged in active management, documentation, and monitoring of resource conditions throughout the State Park System. Many of the specific threats to biological diversity and native species that have emerged in recent years are attributable to, or compounded by, the influence of climate change. Climate-influenced impacts on State Park System resources include accelerated coastal erosion, the spread of pests and pathogens (such as bark beetles), changes in phenology (the timing of seasonal natural phenomena such as blossoms on trees or flowers), alterations to wildlife health and behavior, and increases in the frequency and severity of wildfires. These changes in natural systems due to climate change damage the land, native plants, and wildlife that are the primary natural resources of the State Park System. In the course of my work, I have reviewed information and reports by DPR and other agency staff concerning these phenomena.

7. Scientific studies and models predict that – as a result of increased temperatures, and consequent thermal expansion and glacial ice melt, caused by GHG emissions – by 2100, mean sea levels along the coast will rise between 1 and 7 feet, greatly exacerbating the effects of wave run up (the upper level reached by a wave on a beach) and storm surges. Due to uncertainty in the models, actual mean sea level rise could well exceed the predicted levels by considerable margins. Also, sea level rise will vary by location, and certain areas could experience sea levels that exceed the predicted mean levels.

8. Based upon my professional experience and knowledge of California's State Park System, if the predicted changes in temperature, precipitation, and sea level occur, they would have significant adverse and costly impacts on the State Park System. Additional emissions of

greenhouse gases will continue to drive climate change that will worsen these impacts in the future.

9. Rising sea levels will drastically reduce the amount of beach available for park visitors and shorebirds, including threatened and endangered species. In fact, many of California's beaches, including many in the State Park System, such as Crystal Cove in Orange County, are narrow bands of sand backed by steep cliffs. If the sea level rises as models predict, many beaches will not simply move inland, but will completely disappear. Also, any additional rise in sea level will affect the salinity, temperature, and hydrology in California's many estuaries and lagoons, thereby harming the aquatic life – including rare, threatened and endangered fish – that rely on estuaries for breeding or rearing. In addition, sea level rise threatens infrastructure in the more than 100 coastal units of the State Park System, including numerous campgrounds, trails and roads, and other facilities, including water and waste systems that exist along the ocean's edge. The reduced or destroyed beaches, coastal estuaries, lagoons, and wetlands and the destruction of other fish and wildlife habitats are material impacts to State trust resources. Moreover, damaged infrastructure will also negatively impact the ability of visitors to access the coast, another material impact to the purpose of State Beaches to provide for recreational access to the coast. Finally, sea level rise will negatively impact the balance of payments of the State – as revenues from visitors may decline even as costs to maintain, restore, and protect park resources and facilities increases.

10. In addition, the California State Park System includes many important cultural resources, including archeological and historic sites, such as Native American sites, 18th century missions, historic lighthouses and piers, and buildings, including historic campgrounds and other sites constructed by the Civilian Conservation Corps. These kinds of resources are irreplaceable,

and the protection or documentation of cultural resources that would be inundated by sea level rise would be very expensive. For instance, even a small rise in sea level will erode or inundate the State Park System's many ancient shell middens. These cultural resources, which contain remnants from California's earliest human residents, dating back thousands of years, would be permanently lost for ancestors, visitors, and researchers alike.

11. Global climate change models in combination with other predictive studies also suggest that wildfires will increase in frequency and severity. The State's recent experiences concerning wildfires are generally consistent with these predictions. In 2017, California had the highest average summer temperatures in recorded history. Over the last 40 years, California's fire season has increased 78 days – and in some places in the State the fire season is nearly year-round. Fifteen of the 20 most destructive wildfires in the State's history have occurred since 2000, with 10 of the most destructive occurring since 2015.

12. Increases in the frequency and severity of wildfires will have a significant impact on the State Park System. DPR and its allied agencies, including the California Department of Forestry and Fire Protection, currently expend significant resources to protect park infrastructure and natural and cultural resources from wildfires and to prevent these fires. Growing wildfire activity also increases the risk that irreplaceable resources will be lost, including historic structures. Over the last 15 years, several state parks have been impacted by wildfires, and the increasing frequency of wildfires has become a more important problem for the State Park System. For example, the October 2017 Wine Country fires in Napa and Sonoma Counties burned through several state parks, including Trione-Annadel State Park, Sugarloaf Ridge State Park and Robert Louis Stevenson State Historic Park, and threatened Jack London State Historic Park.

13. Observed changes, along with global climate change models, also suggest that coastal fog declines observed in recent decades could accelerate due to GHG-driven warming and changed ocean circulation. Diminished fog would have a severe and damaging impact on natural forest types that are dependent upon fog, including Torrey pine, Monterey pine, and Coast redwood. In addition to the ecological impacts, these forest types draw many visitors to the State Park System, and a decline in these forests would reflect a critical impact on the natural resources of the State Park System, would result in fewer visitors, and a loss of revenue to DPR.

14. DPR also manages several parks in winter snow areas, as well as the Sno-Park Program for California, which provides the public roadside access to winter sports recreation. Global climate change models and other studies predict reductions in winter-spring snowpack, which would result in loss of recreational opportunities, increased flooding downstream, along with operational challenges and associated costs at reservoir parks. It may also reduce associated revenues associated with the Sno-Park Program.

15. While significant and unavoidable impacts from climate change are already impacting the resources of the State Park System as summarized above, the most extreme impacts of climate change on the State Park System likely depend on current and future greenhouse gas emissions and measures taken to reduce those emissions. Continued emissions of greenhouse gases, such as methane from the oil and natural gas industry, will result in increased impacts to the State Park System of the type I have described in this declaration.

I state under penalty of perjury under the laws of the United States of America that the foregoing is true and correct to the best of my knowledge and belief.

Executed on September 14, 2020 in SACRAMENTO, California.

JAY CHAMBERLIN

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

STATE OF CALIFORNIA, *et al.*, *Petitioners*, v. ANDREW R. WHEELER, in his official capacity as Administrator, United States Environmental Protection Agency, *et al.*, *Respondents.*	No. 20-1357 (and consolidated cases)

DECLARATION OF LISA BERRY ENGLER

I, Lisa Berry Engler, declare of my personal knowledge as follows:

1. I am currently employed by the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) as Director of the Office of Coastal Zone Management (CZM). CZM is the lead policy and planning agency on coastal and ocean issues in Massachusetts. I have held this position for a year and a half. I have been employed by CZM since 2011, having held positions with increasing responsibility. I previously held the position of Assistant Director, Boston Harbor Regional Coordinator, Acting Director for the Massachusetts Bays National Estuary Program (MassBays), and MetroBoston Regional Coordinator for

MassBays. Prior to joining CZM, I held positions with the Massachusetts Department of Transportation and the Massachusetts Department of Conservation and Recreation.

2. I have extensive professional knowledge and experience regarding the impacts of climate change on coastal resources and communities in Massachusetts, as well as Massachusetts' efforts to plan and prepare for such impacts. My job duties include providing oversight and administration for CZM and directing policy development, planning efforts, and technical approaches for CZM program areas. I supervise a team of 34 multidisciplinary professionals working in a range of program areas, including climate change adaptation and coastal resilience administered as CZM's StormSmart Coasts Program. Many of the staff I oversee have significant professional experience in coastal and environmental management, planning, science, policy, and other related fields. I routinely engage and partner with scientific and technical subject matter experts in federal agencies and academia. As part of my management responsibilities, I oversee CZM's work to provide information, strategies, tools, and financial resources to support communities and people working and living on the Massachusetts coast to address the challenges of erosion, flooding, storms, sea level rise, and other climate-change-related impacts. For instance, I oversee the development of sea level rise decision-support tools and services including inundation maps and guidance

documents. I also direct CZM's work to provide policy and planning support and technical assistance to other state agencies, local communities, and private entities regarding adapting and increasing resilience to current and future impacts of climate change on our coast. For example, I oversee CZM's StormSmart Coasts Program that offers competitive grants, hands-on technical and planning assistance, and decision-support tools to Massachusetts cities and towns for the purposes of planning for and adapting to sea level rise and other climate-change-related coastal hazards.

3. In my role with CZM, I chair and participate in various legislative and executive branch official groups, including the Massachusetts Ocean Advisory Commission and Science Advisory Council and associated work groups. I also represent the Commonwealth of Massachusetts (Commonwealth) on several multi-state organizations, including the Coastal States Organization, Northeast Regional Ocean Council, and the Gulf of Maine Council on the Marine Environment.

4. I have a Bachelor's degree in Biology from Colby College and a Master's degree in Environmental Management from Duke University.

5. I am aware of and familiar with the science related to global climate change. My knowledge comes from my review of scientific peer-reviewed literature and consensus assessment reports, attendance at professional conferences and workshops, and professional exposure to other research and material. As a

result of my professional experience and my knowledge of the peer-reviewed literature and reports, as well as my knowledge of the Massachusetts coastal resources and policies and planning related thereto, I can attest to the following.

6. The purposes of this declaration are to: (i) briefly describe the serious harms that climate change, caused in part by methane emissions from new and existing sources in the oil and natural gas sector, is causing and will continue to cause to Massachusetts' coastal resources, infrastructure, and communities; and (ii) briefly summarize extensive state and local initiatives, programs, and plans to respond to and prepare for such impacts. I am submitting this declaration in support of State Petitioners' Emergency Motion for Stay Pending Review of the United States Environmental Protection Agency's final action entitled *Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review*, 85 Fed. Reg. 57.018 (Sept. 14, 2020), which rescinds standards for reducing emissions of methane from new sources in the oil and gas industry, removes sources in the transmission and storage segments of the oil and gas industry from regulation entirely, and announces that EPA is no longer authorized or obligated to regulate existing sources of methane emissions in the oil and gas industry.

Climate Change Threatens Massachusetts' Coastal Resources and Communities

7. The accelerated rate of global sea level rise and the severity and timing of coastal impacts due to this rise in sea level are largely dependent on current and future global greenhouse gas emissions, including carbon dioxide emissions, and reduction measures. Continued emissions of greenhouse gases, including methane emissions from new and existing sources in the oil and natural gas sector, will result in increases in global temperature, yielding additional contributions to global sea level rise (*i.e.*, increased contributions from thermal expansion of warmer waters and melting of land-based ice sheets).[1]

8. Human-caused climate change has led to a rise in global mean sea levels of 7 to 8 inches since 1900, and a rate of rise greater than that in any preceding century in the last 2,800 years.[2] Global average sea levels will continue to rise by 1 to 4 feet by 2100, and emerging science regarding Antarctic ice sheet instability indicates sea level rise of as much as 8 feet by 2100 cannot be ruled out.[3] Due to the relationship of the East Coast to the Gulf Stream and melting

[1] *See generally* U.S GLOBAL CHANGE RESEARCH PROGRAM, CLIMATE SCIENCE SPECIAL REPORT: FOURTH NATIONAL CLIMATE ASSESSMENT, VOLUME I (D.J. Wuebbles et al. eds., 2017), https://science2017.globalchange.gov/.

[2] *Id.* at 10.

[3] *Id.*

Antarctic ice sheets, sea level rise will be higher than the global average on the East and Gulf Coasts of the United States.[4]

9. A March 2018 report entitled *Massachusetts Climate Change Projections* (2018 Projections Report), developed by a team of scientists from the U.S. Department of the Interior's Northeast Climate Adaptation Science Center at the University of Massachusetts Amherst, presents the best available, peer-reviewed science on climate change downscaled, or localized, for Massachusetts through the end of this century.[5] The 2018 Projections Report identifies substantial increases in air temperatures, precipitation, and sea levels across Massachusetts as a result of human-caused greenhouse gas emissions.

10. A key component of the 2018 Projections Report is sea level rise projections for the state's coastline. The analysis for Massachusetts consisted of a probabilistic assessment of future relative sea level rise at tide gauge stations with long-term records at Boston Harbor, MA, Nantucket, MA, Woods Hole, MA, and Newport, RI.[6] The sea level projections are based on a methodology that provides complete probability distributions for different greenhouse gas emissions

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[4] *Id.*

[5] MASSACHUSETTS CLIMATE CHANGE PROJECTIONS (2018), https://nescaum-dataservices-assets.s3.amazonaws.com/resources/production/MA%20Statewide%20and%20MajorBasins%20Climate%20Projections_Guidebook%20Supplement_March2018.pdf.

[6] *See id.* at 11 (citing Robert M. DeConto & Robert E. Kopp, *Massachusetts Sea Level Assessment and Projections*, Technical Memorandum (2017).

scenarios.[7] Working with the principal investigators (Robert DeConto and Robert Kopp) and a team of external peer reviewers, CZM reviewed and synthesized the downscaled projections, which are made available by the Commonwealth, to set forth a standard set of sea level rise projections to be used by municipalities, state government, industry, the private sector, and others to assess vulnerability and identify and prioritize actions to reduce risk. Given a high emissions pathway, Massachusetts is projected to experience approximately 4.0 to 7.6 feet of sea level rise over the twenty-first century, with 10.2 feet possible when accounting for higher ice sheet contributions.

11. Massachusetts has 2,819 miles of tidal coastline, and a coastal zone (land areas from the shoreline to 100 feet inland of major roads or railways from New Hampshire to Rhode Island) that encompasses 886 square miles. Approximately 4.9 million people or 75% of the Commonwealth's population (as of the 2010 U.S. census) reside in coastal counties. In 2014, the total output of the Massachusetts coastal economy was $249.2 billion, representing over 54% of the state's annual gross domestic product, and coastal counties accounted for 53% of the state's employment and wages.[8] Approximately 170,000 year-round residents

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[7] *See id.* (citing Robert E. Kopp et al., *Probabilistic 21st and 22nd century sea level projections at a global network of tide gauge sites*, 2 EARTH'S FUTURE 383–406 (2014)).

[8] NAT'L OCEAN ECONOMICS PROGRAM, STATE OF THE U.S. OCEAN AND COASTAL ECONOMIES: COASTAL STATES SUMMARIES – 2016 UPDATE 29 (2016),

are currently (as of the 2010 U.S. census) located within coastal flood hazard areas, as defined by the Federal Emergency Management Agency (FEMA), and are susceptible to 1% annual chance coastal storm flooding under current sea level conditions.[9] Accelerated sea level rise will lead to more regular flooding of developed and natural coastal areas due to an increase in the extent of tidal inundation, and will also exacerbate erosion along beaches, dunes, and coastal banks.

12. In addition, there is very high confidence that sea level rise will increase the frequency and extent of extreme flooding associated with coastal storms, such as hurricanes and nor'easters.[10] Coastal storm events will cause inundation of larger areas, and will occur more frequently, damaging or destroying coastal engineering structures such as seawalls, critical infrastructure such as wastewater treatment plants and transportation systems, and private property.

13. More frequent and severe storm surge and inundation will create serious risks for public safety and health, especially where sewer mains and pump stations are impacted. Frequent tidal flooding from sea level rise may also lead to

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http://midatlanticocean.org/wp-content/uploads/2016/03/CoastalStatesSummaryReports_2016.pdf.

[9] *See* Mark Crowell et al., *Estimating the United States Population at Risk from Coastal Flood-Related Hazards*, *in* COASTAL HAZARDS, 151, 167 (Charles W. Finkl ed., 2013), https://tinyurl.com/yaolf6bk.

[10] *See* U.S GLOBAL CHANCE RESEARCH PROGRAM, *supra*, at 27.

increases in respiratory diseases due to mold from dampness in homes.[11] Saltwater intrusion—or the increased penetration of salt water into sources of fresh water—from sea level rise will impact water resources (such as drinking water) by contaminating freshwater sources with salt water and also through the corrosion of water supply infrastructure.

14. The Massachusetts coastline includes a diverse array of ecosystems including, among others, sandy beaches, rocky shores, barrier beaches, islands, estuaries, and salt marshes. These ecosystems offer immense recreational, cultural, and aesthetic value to the residents of and visitors to the Commonwealth, while also serving important ecological functions. For instance, some natural coastal resources, including barrier beaches, salt marshes, and estuaries, provide valuable resilience services to the Commonwealth by buffering inland coastal communities and the built environment from storm surges and flooding. Salt water will also impact these coastal resources, as saltwater intrusion into estuarine habitats such as salt marshes and freshwater wetlands will alter the composition of the plant species and affect wildlife that depend on these ecosystems.

[11] *See generally* CENTERS FOR DISEASE CONTROL & PREVENTION, U.S. DEP'T OF HEALTH & HUMAN SERVS., COASTAL FLOODING, CLIMATE CHANGE, AND YOUR HEALTH: WHAT YOU CAN DO TO PREPARE (2017), www.cdc.gov/climateandhealth/pubs/CoastalFloodingClimateChangeandYourHealth-508.pdf.

Massachusetts is Experiencing Economic Impacts from Climate Change and Will Expend Significant Resources to Prepare for the Impacts of Climate Change on Our Coastal Areas

15. The Commonwealth is already experiencing the impacts of climate change. The relative sea level trend at the Boston tide station is 2.83 millimeters per year based on monthly mean sea level data from 1921 to 2018, which is equivalent to a change of 0.93 feet over 100 years.[12]

16. These impacts are directly harming the welfare of Massachusetts residents and causing significant economic losses. Coastal storms currently result in severe coastal flooding with extensive damage to public infrastructure, private homes and businesses, and a significant demand for emergency services. For example, a coastal storm on March 2–3, 2018, which reached the third-highest water level recorded at the Boston Harbor tide gauge, resulted in major flooding, damages, and expenditures for response and recovery. The Massachusetts Emergency Management Agency determined that response and repair costs exceeded $24 million across six coastal counties. On April 30, 2018, Massachusetts Governor Charles Baker requested a federal disaster declaration, which the Trump Administration approved on June 25, 2018. The disaster

[12] *See* Nat'l Oceanic & Atmospheric Admin., *Relative Sea Level Trend 8443970 Boston, Massachusetts*, TIDES & CURRENTS, https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=8443970.

declaration authorized FEMA Public Assistance funding for eligible applicants. As of June 2019, FEMA has obligated over $4 million for public storm-related costs.

17. Rising sea levels increase the frequency, depth, and duration of coastal flooding events; and the associated magnitude of damage costs, including costs associated with the increased demand on first responders, will escalate accordingly.

18. Sea level rise and other impacts of a changing climate pose major risks to communities in Massachusetts' coastal zone. Looking out to the end of the century, a 2018 study analyzed the number of coastal homes and commercial properties throughout the United States that will be at risk from frequent tidal flooding (meaning at least 26 higher tides per year) as a result of projected sea level conditions without any storm events.[13] In Massachusetts, over 89,000 existing homes and 8,000 commercial properties may be disrupted by chronic tidal flooding or inundation by 2100 under a high-emissions scenario. The 2018 market value of residential buildings at risk of higher tides in 2100 was estimated at $63 billion, and these homeowners currently contribute over $400 million to the local property tax base.[14]

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[13] *See* UNION OF CONCERNED SCIENTISTS, UNDERWATER: RISING SEAS, CHRONIC FLOODS, AND THE IMPLICATIONS FOR US COASTAL REAL ESTATE (2018), www.ucsusa.org/resources/underwater.

[14] *See* Massachusetts-specific data available at: www.ucsusa.org/sites/default/files/attach/2018/06/underwater-data-by-state.xlsx.

19. Development along the Massachusetts coast is afforded protection from coastal buffers such as beaches and dunes, and from engineered coastal infrastructure such as revetments and seawalls. These coastal engineered structures will experience greater impacts from flooding and wave energy from the anticipated increase in frequency and intensity of coastal storm events associated with accelerated sea level rise and climate change. With these greater impacts will come more frequent need for maintenance and replacement of coastal engineered structures as well as beaches in the form of sediment nourishment at significant costs. For example, the Town of Winthrop needed additional protection from storm surge and flooding impacts for a suburban neighborhood with existing engineered shoreline structures and an eroding beach. At a cost of approximately $25 million in state funding, 460,000 cubic yards of sand, gravel and cobble were placed along 4,200 linear feet of shoreline in 2013–2014. The community gained approximately 150 feet of beach width at high tide and increased protection against wave energy and coastal storms. Other communities across Massachusetts (*e.g.*, New Bedford, Rockport, Duxbury, and Scituate) have worked to design beach nourishment projects and address erosion and failing coastal engineered structures that will be exacerbated by sea level rise and increased flooding from coastal storms.

20. Coastal engineered structures, such as seawalls and revetments, have been constructed on over a quarter of the Commonwealth's ocean-facing shoreline

to protect public and private infrastructure and assets from flooding and erosion. The Commonwealth and its municipalities own approximately 92 miles of such structures along the coastline. As a result of wave forces on the coastal structures and lowered beach elevations, the Commonwealth and local governments routinely invest millions of dollars to repair and reinforce these structures so they can adequately protect coastal communities. For example, in 2018 a seawall reconstruction project was completed in the Town of Marshfield to address coastal flooding and public safety issues. The Commonwealth provided a $1.85 million grant and loan award to the town, which was matched with roughly $620,000 in local funds. The approximately 600-foot section of seawall sustained damages during a coastal storm in January 2015, and the state-funded project increased the height of the seawall by two to three feet to better protect a public road, utilities, and homes. The Town of Marshfield has 32 coastal engineered structures along 12 miles of exposed shoreline, totaling over 20,000 feet (3.9 miles) that have been identified as needing repairs and retrofits to address the current and future threats of coastal storms. With higher flood levels and greater storm surges, significantly more investments will be required to achieve the current flood-design protections afforded by these engineered structures across the coast.

21. The Commonwealth owns a substantial portion of the state's coastal property. The Commonwealth owns, operates, and maintains approximately 177

coastal state parks, beaches, reservations, and wildlife refuges located within the Massachusetts coastal zone. The Commonwealth also owns, operates, and maintains numerous properties, facilities, and infrastructure in the coastal zone, including roads, parkways, piers, and dams. Rising sea levels along the Massachusetts coast will result in either the permanent or temporary loss of the Commonwealth's coastal property through inundation, storm surge, flooding, and erosion events. These projected losses of coastal property will likely destroy or damage many of the state-owned facilities and infrastructure described above. The Commonwealth likely will be required to expend significant resources to protect, repair, rebuild, or possibly relocate the affected properties, facilities, and infrastructure. According to the Commonwealth's 2018 *State Hazard Mitigation and Climate Adaptation Plan*,[15] the replacement cost of state-owned facilities exposed to FEMA's 1% annual chance flood event in coastal counties exceeds $500 million.

22. The Massachusetts coastal zone is home to several major ports including the Port of Boston and New Bedford/Fairhaven Harbor. Recent economic studies indicate the income generated from the Massachusetts maritime economy supports 2.6% of the state's direct employment and 1.3% of gross

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[15] Available at: www.mass.gov/service-details/massachusetts-integrated-state-hazard-mitigation-and-climate-adaptation-plan.

domestic product.[16] In 2018, New Bedford/Fairhaven Harbor alone generated $3.7 billion in direct business revenue from seafood processing and fleet operation businesses.[17] By nature of their purpose, the state's ports and harbors are generally low-lying, coastal-dependent areas of high density-built environment and are susceptible to service interruption and associated revenue loss when flooded or otherwise impacted by coastal events. Additionally, coastal dependent businesses, maritime schools, and public facilities and departments will face disruptions in service in post-storm conditions.

23. The Commonwealth is committed to protecting public safety, human health, the environment, and public resources through programs and policies that address sea level rise and other climate-change-related coastal hazards. EEA and CZM provide information, strategies, and tools to help other state agencies and communities plan for and address the challenges of erosion, flooding, storms, sea level rise, and other climate change impacts.

24. Of more than $32 million requested over the past five years alone, CZM has awarded approximately $17 million in state-funded grants to local

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[16] *See* DAVID R. BORGES ET AL., UMASS DARTMOUTH PUBLIC POLICY CTR., NAVIGATING THE GLOBAL ECONOMY: A COMPREHENSIVE ANALYSIS OF THE MASSACHUSETTS MARITIME ECONOMY 11 (2018), www.mass.gov/files/documents/2018/01/24/Maritime_Economy.pdf.

[17] MARTIN ASSOCIATES & FOTH-CLE ENG'G GROUP, ECONOMIC IMPACT STUDY OF THE NEW BEDFORD/FAIRHAVEN HARBOR 5 (2019), www.newbedford-ma.gov/mayor/wp-content/uploads/sites/3/Martin-Report-Exec-Summary-2019.pdf.

communities to support sea level rise adaptation planning and implementation through the Coastal Resilience Grant Program. Local governments have matched these state funds with roughly $8.3 million in local funds and in-kind services for coastal resilience. Since 2017, EEA has awarded over $33 million in municipal grants for climate vulnerability planning and implementation statewide through the Municipal Vulnerability Preparedness (MVP) Program. Since the start of the MVP Program, local governments have matched MVP grants with almost $13 million in local funds and staff time. Between both CZM and EEA programs, the total amount of funding requested in 2018 was $8.3 million, and in 2019 increased to $29.3 million. And at the time of this declaration the amount of funding requested in 2020 is $31.3 million in MVP funds. There is a growing need at the local level for support.

25. Municipalities, private entities, and other partners have begun to support planning to address the impacts of sea level rise and other climate change impacts in Massachusetts and fund implementation of adaptation measures. Adaptation planning efforts include vulnerability assessments to determine areas and infrastructure susceptible to coastal impacts, prioritization of vulnerable assets and areas, and development of adaptation alternatives to mitigate climate risks in the near and long term. One example is the City of Boston's "Climate Ready Boston" initiative, which is developing district-level adaptation plans to address

near-term coastal flooding and establish a framework for the funding and implementation of long-term, broader scale solutions. For the East Boston and Charlestown neighborhoods, the City of Boston identified near-term (2030–2050) and long-term (2050–2070) actions for addressing future flood risks created by sea level rise. The City of Boston's report estimates the costs for these actions range from $202 million to $342 million for East Boston and Charlestown alone.[18] More recently, the city completed a coastal resilience plan for the South Boston neighborhood and in 2020 will finish a similar plan for the Downtown area. Another example of planning for the impacts of coastal climate change is the *Great Marsh Coastal Adaptation Plan* led by the National Wildlife Federation in partnership with the Ipswich River Watershed Association.[19] The plan assesses climate impacts and vulnerability for the Great Marsh region and each of its six communities (Salisbury, Newburyport, Newbury, Rowley, Ipswich, and Essex), examining the risk and exposure of critical infrastructure and natural resources, and identifies areas of special concern. The plan states that in Newburyport, estimated one-time damages to buildings and structures (not contents) from a 1%

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[18] *See* COASTAL RESILIENCE SOLUTIONS FOR EAST BOSTON AND CHARLESTOWN: FINAL REPORT (2017), www.boston.gov/sites/default/files/climatereadyeastbostoncharlestown_finalreport_web.pdf.

[19] *See* TAJ SCHOTTLAND ET AL., GREAT MARSH COASTAL ADAPTATION PLAN (2017), www.nwf.org/-/media/Documents/PDFs/NWF-Reports/NWF-Report_Great-Marsh-Coastal-Adaptation-Plan_2017.ashx.

annual exceedance probability storm (also known as the 100-year storm) under 1.09 feet of sea level rise would be $18.3 million and under 3.45 feet of sea level rise the damages would increase to $32.4 million.[20]

26. In conclusion, any increase in the rate of sea level rise and the frequency, magnitude, and severity of coastal flooding, erosion, and storms related to greenhouse gas emissions, including methane emissions from new and existing sources in the oil and natural gas sector, will adversely impact the Commonwealth and its residents and will require the Commonwealth to expend additional resources and incur additional costs.

I declare under penalty of perjury that the foregoing is true and correct.

Executed in Belmont, Massachusetts on September 15, 2020.

Lisa Berry Engler

Lisa Berry Engler
Director
Massachusetts Office of Coastal Zone Management

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[20] *Id.* at 49, tbl.3.3-3.

ORAL ARGUMENT NOT YET SCHEDULED

No. 20-1357

Consolidated with No. 20-1359

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

STATE OF CALIFORNIA, et al.,
Petitioners,

v.

ANDREW WHEELER, ADMINISTRATOR, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, et al.,
Respondents,

DECLARATION OF ELIZABETH BISBEY-KUEHN

I, Elizabeth Bisbey-Kuehn, state and declare as follows:

1. I have been the Bureau Chief with the New Mexico Environment Department Air Quality Bureau since 2018.

2. My position provides leadership and supervision of the administrative, financial, compliance, permitting, operations, and planning sections of the Air Quality Bureau. My position directs the overall management of resources including staff who enforce the state and federal air quality standards; provide air quality related planning and policy, operational, permitting, and compliance and enforcement services to New Mexico employers; financial oversight of the bureau's federal grant and state matching funds, and support services for the bureau.

3. My previous experience with the Air Quality Bureau includes over 13 years of experience as a staff and manager of two sections within the Permitting program that included direct experience implementing state and federal oil and gas air regulations, developing state general construction permits for the oil and gas sector, and advising the development of air quality regulations.

4. I am familiar with the rule published by U.S. EPA Administrator Andrew Wheeler on September 14, 2020, regarding "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review," referred to by EPA as the Final Policy Amendments (the "Final Rule"). The Final Rule revises the new source performance standards (NSPS) at 40 Code of Federal Regulations (CFR) part 60, subparts OOOO and OOOOa.

5. The Final Rule removes the transmission and storage segment from NSPS OOOO and OOOOa, rescinds VOC and methane emissions standards for that segment, and rescinds methane emissions standards for the production and processing segments.

6. According to EPA's Regulatory Impact Analysis (RIA), the Final Rule will result in the emission of 11,000 extra tons of volatile organic compounds (VOC) and 330 tons of hazardous air pollutants. It will also result in 400,000 tons of extra methane emissions, equivalent to 9 million tons of carbon dioxide. The RIA does not contain any state-specific emission projections.

7. New Mexico is home to a large and growing oil and gas industry. In 2018 it accounted for 4% of U.S. natural gas production. Between 2013 and 2018, annual crude oil production in New Mexico more than doubled, raising the state from the 7th to the 3rd largest oil producer in the nation, accounting for 6% of national production.[1]

[1] Energy Information Agency, https://www.eia.gov/state/?sid=NM#tabs-3

8. The Permian basin, which straddles the New Mexico-Texas state line, is the most prolific crude oil production region in the U.S. Despite the economic downturn caused by the Covid-19 pandemic, the U.S. Energy Information Agency forecasts that Permian crude oil production will increase by 0.8 million barrels/day from 2019 levels, to a 2020 average for 5.2 million b/d.[2] According to state data compiled by the Oil Conservation Division, New Mexico contains over 59,000 active oil and gas wells. Given the size of New Mexico's oil and gas production industry, and its prospect for continued growth, it is inevitable that the deregulatory actions of the Final Rule will increase emissions in New Mexico.

9. The Final Rule therefore directly undermines New Mexico's public health and environmental investment to reduce VOC emissions that contribute to unhealthy ozone levels. Several ozone monitors in New Mexico show that air quality is approaching the level of the 2015 ozone National Ambient Air Quality Standard (NAAQS). The Sunland Park area in southern New Mexico is currently designated as nonattainment of the 2015 ozone NAAQS, with an additional seven areas in the State monitoring ozone concentrations at or above 95% of the standard. Monitored ozone concentrations increased throughout New Mexico over the past five years (2014-2018), including in both of New Mexico's oil and natural gas producing regions, the San Juan and Permian Basins.

10. According to the EPA's latest National Emissions Inventory (EPA, 2014 NEI version II), over 80% of the local emissions in these areas are from oil and natural gas sources. The Carlsbad ozone air monitor (AQS ID # 35-015-1005) in the Permian Basin, which as noted is an area of rapid growth in oil production, demonstrates the air pollution problems facing New

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[2] https://www.eia.gov/todayinenergy/detail.php?id=42615#:~:text=EIA%20forecasts%20that%20Permian%20crude,of%205.6%20million%20b%2Fd.

Mexico. The design value for ozone at this monitor has elevated from 68 ppb in 2016 to 74 ppb in 2018. Preliminary 2019 and 2020 data shows some of the highest monitored ozone concentrations recorded in the past decade, indicating this upward trend will continue throughout the state.

11. To improve air quality in these areas, NMED developed the Ozone Attainment Initiative (OAI) and joined the EPA's Ozone Advance program in 2018 and 2019. As part of the OAI, NMED is currently researching and reviewing possible options for mandatory control measures for all source sectors through photochemical modeling; however, future year emissions inventories and modeling assume that both the 2012 and 2016 NSPS rules will be in place, casting doubt on the ability of resultant control measures selected for adoption through the OAI to achieve emissions reductions.

12. NSPS OOOO and OOOOa are fundamental to reducing emissions from the oil and natural gas sector, with any roll back or relaxation of emission standards making it more difficult for New Mexico to keep these counties in attainment. Removing NSPS requirements that limit ozone precursors while ozone levels are dangerously close to exceeding the NAAQS increases the risk of a nonattainment designation and nonattainment permitting requirements for New Mexico's oil and natural gas industry.

13. Previous modeling studies (Adelman et.al, 2016) and preliminary back-trajectory analyses indicate that interstate transport from the Permian Basin in Texas contributes to high ozone concentrations in southern and southeastern New Mexico. While New Mexico faces nonattainment designations and increased permitting requirements, Texas does not operate an ozone monitor on their side of the Permian Basin. Thus, the EPA lacks the required information to make a regulatory determination regarding attainment of the ozone standard, thereby creating

an uneven playing field across state lines. This increases the need for strong, federally-enforceable NSPS emissions standards for the oil and natural gas sector to ensure fair and equitable requirements in a basin that spans state lines.

14. Exceeding ozone standards results in a nonattainment status designation which leads to expensive requirements for communities and the State of New Mexico. A nonattainment designation under section 107(d) of the CAA carries potentially serious sanctions and damaging repercussions for an area, including the potential loss of federal highway funding and economic development opportunities. States that contain nonattainment areas are required to develop a State Implementation Plan (SIP) designed to bring an area back into attainment with the NAAQS through the adoption of stricter emission controls (e.g., Reasonably Available Control Technology) and permitting requirements (emissions offsets) for emission sources that cause or contribute to poor air quality. Once an area in New Mexico is designated nonattainment for ozone, not only will this trigger minor New Source Review (NSR) construction permits for sources at the minor source permit threshold of 10 pounds per hour (pph) or 25 tons per year (tpy) of VOC emissions, major source nonattainment permits will be required when VOC emissions from a new source or from a major modification at an existing source are projected to occur. The applicability thresholds of nonattainment permitting will depend on the nonattainment designation but are generally low thresholds and will affect thousands of sources. These permitting requirements will have a significant and negative impact on NMED and permittees.

15. Permittees looking to construct or modify a facility in an ozone nonattainment area are subject to the following: (1) Lowest Achievable Emission Rate (LAER) control techniques, which unlike PSD, do not consider the cost of controls; (2) requiring applicants to obtain permanent emission reductions through the purchase of emission offsets, which may or

may not be available, from permittees of existing sources; (3) requiring complicated ambient air impact analyses to demonstrate a net air quality benefit from the proposed project; (4) requiring additional public outreach and participation from Federal Land Managers and the EPA; and (5) requiring expensive air quality permits that take significant resources and time for the permittee and NMED to prepare and process. Such changes require pre-approval through an air quality permit. Without similar requirements across state lines, New Mexico is at a competitive disadvantage.

16. New Mexico relies upon the NSPS OOOO and OOOOa regulations as they are incorporated into state law to control VOC emissions from small oil and natural gas sources with the goal of mitigating ozone ambient impacts within New Mexico and neighboring states. Without these regulations in place, New Mexico faces adverse public health impacts and a nonattainment designation, including minor and major nonattainment air quality permitting.

17. The EPA failed to account for the incremental costs to states in implementing a nonattainment NSR program as a direct result of the Final Rule preempting state law. Further, the Final Rule also fails to account for the increased cost of health care to states and lost economic revenues to states from preempting state authority.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 9/19/20 (date)

[signature] (Signature)

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

STATE OF CALIFORNIA, et al., *Petitioners*, v. ANDREW R. WHEELER, et al., *Respondents*.	No. 20-1357

DECLARATION OF JARED SNYDER

I, Jared Snyder, declare as follows:

1. I am the Deputy Commissioner for Climate Change, Air and Energy at the New York State Department of Environmental Conservation (DEC). In this capacity, I am responsible for overseeing the development and implementation of clean air programs and climate change strategies in New York State. This includes regulations required for the implementation of the Clean Air Act (Act), other State actions to reduce air pollution, and State efforts to reduce greenhouse gas (GHG) emissions, including emissions of methane, and combat climate change.

2. I submit this declaration in support of the State Petitioners' motion to stay the final action of the United States Environmental

Protection Agency (EPA): (1) rescinding the 2016 new source performance standards regulating emissions of methane, volatile organic compounds (VOCs), and hazardous air pollutants from the transmission and storage sectors of the oil and natural gas industry; and (2) rescinding the 2016 new source performance standards regulating methane emissions from the remaining sources in the oil and natural gas source category. EPA's final rule is entitled "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review," published at 85 Fed. Reg. 57,018 (Sept. 14, 2020) (Rule).

PERSONAL BACKGROUND AND QUALIFICATIONS

3. I received a Bachelor of Arts degree in economics from Cornell University in 1981. I obtained a Juris Doctor from Harvard Law School in 1984.

4. I have been in my current role since joining DEC in 2007, although the name of the position has changed. Prior to joining DEC, I managed air and climate change litigation for the New York State Office of the Attorney General. Prior to that, I worked for the United States Department of Justice handling environmental enforcement matters.

5. My responsibilities as Deputy Commissioner include oversight of DEC's Office of Climate Change and DEC's Division of Air Resources. Among other things, both units within DEC assess the sources of GHG emissions within the State, evaluate existing federal and State programs aimed at reducing such emissions, consider potential regulations and other strategies to further reduce GHG emissions, and develop and implement such programs to help achieve the State's overall GHG emission reduction objectives and requirements.

STATEWIDE GHG EMISSION REDUCTION OBJECTIVES AND PROGRAMS

6. The State's overall GHG emission reduction objectives include requirements to reduce Statewide GHG limits by 40 percent from 1990 levels by 2030, and by 85 percent from 1990 levels by 2050, as established by the recently enacted Climate Leadership and Community Protection Act, Chapter 106 of the Laws of 2019 (CLCPA). Environmental Conservation Law (ECL) § 75-0107.

7. The Statewide GHG emission reduction requirements established by State statute in the CLCPA are applicable to all sources of GHG emissions, including but not limited to oil and natural gas facilities subject to the Rule, which emit the potent GHG methane.

Importantly, as defined by the CLCPA, Statewide GHG emissions include all emissions of GHGs from sources within the State, as well as GHGs produced outside of the State associated with either the generation of electricity imported into the State or the extraction and transmission of fossil fuels imported into the State. ECL § 75-0101(13).

8. Under the CLCPA, DEC is required to take multiple regulatory actions. This includes the requirement that DEC promulgate regulations to ensure compliance with the Statewide GHG emission limits. ECL § 75-0109. In promulgating such regulations, the CLCPA requires DEC to incorporate measures to minimize leakage, which is defined as a reduction of GHG emissions within the State that is offset by an increase in emissions outside of the State. *Id.*; ECL § 75-0101(12).

9. On top of these Statewide GHG emission reduction and rulemaking requirements, the CLCPA also requires that 70 percent of the State's electricity come from renewable energy sources by 2030, and that 100 percent of the State's electricity come from carbon-free energy generation sources by 2040. Public Service Law § 66-p.

10. Consistent with the Statewide GHG emission reduction and clean energy generation requirements set forth in the CLCPA, the State

has established numerous regulatory programs to reduce GHG emissions. For instance, the State participates in the Regional Greenhouse Gas Initiative (RGGI) program, which is implemented through and codified in DEC regulations. N.Y. Comp. Codes R. & Regs. (NYCRR) tit. 6, Part 242. RGGI sets an overall cap on collective carbon dioxide (CO_2) emissions from subject power plants. In addition to its participation in RGGI, DEC has also promulgated regulations that establish CO_2 emission rate limits on individual power plants. 6 NYCRR Part 251 (Part 251).

11. DEC is also developing State-specific methane emission reduction requirements on sources in the oil and natural gas sector in the State, particularly in light of the requirements established by the CLCPA.

ROLE OF FEDERAL GHG EMISSION REDUCTION PROGRAMS AND REGULATION UNDER SECTION 111 OF THE ACT

12. Regardless of the State's own actions to reduce GHG emissions, including methane emissions, DEC and the State have long sought federal regulation of GHG emissions. This includes longstanding support for EPA's authority to regulate GHG emissions pursuant to its

authority under Section 111 of the Act, which DEC and the State have documented on numerous occasions such as through the submittal of comments on the record for various EPA regulatory proposals.

13. Most notably, DEC and the State supported EPA's adoption and implementation of the Clean Power Plan, which regulated for the first time under the Act CO_2 emissions from power plants. Part of the reason for DEC's support of the Clean Power Plan in particular, and EPA's authority to regulate GHG emissions under Section 111 of the Act in general, is the fact that it would require GHG emission reductions nationally. This includes ensuring some level of GHG emission reductions from power plants in states other than New York and other states that participate in RGGI or similar programs.

14. Given the magnitude of the climate change challenge, GHG emission reductions are necessary in all states across the country, and not just in New York and other states that impose state-specific GHG emission reduction requirements on significant sources of such emissions, such as power plants and oil and natural gas facilities. Absent the implementation of meaningful emission reduction requirements pursuant to EPA's authority to regulate GHG emissions under Section

111 of the Act, there would be increases in GHG emissions nationally, or at least a lesser amount of national GHG emission reductions.

15. Moreover, federal requirements to reduce GHG emissions, including by EPA pursuant to its authority under Section 111 of the Act, help to both ensure a level playing field and minimize the possibility of emissions leakage. Without nationwide requirements to meaningfully reduce GHG emissions, businesses exposed to higher costs resulting from in-state regulation may seek to move to states that do not impose any GHG emission reduction requirements. That could lead to increased GHG emissions leakage, which is an increase in GHG emissions outside of the State that offsets GHG emission reductions within the State.

16. This increased likelihood of GHG emissions leakage is harmful to the State and directly counter to the State statutory requirements set forth in the CLCPA, including for DEC to incorporate measures to minimize leakage in its regulatory actions to ensure compliance with the Statewide GHG emission limits. ECL §§ 75-0101(13), 75-0107.

UNREGULATED METHANE EMISSIONS NATIONWIDE WILL HARM NEW YORK STATE

17. The Rule increases the likelihood that New York State will continue to experience worsening harms associated with global climate change. Under EPA's own analysis, the Rule will directly cause increases in nationwide methane emissions, as well as emissions of VOCs and hazardous air pollutants, by removing the transmission and storage segments of the oil and natural gas sector from the regulated source category. The Rule will also result in the continued emission of millions of tons of avoidable methane emissions because EPA takes the position that the Rule removes its obligation to promulgate guidelines under Section 111(d) of the Act for controlling such emissions from existing oil and natural gas sources, which account for the majority of methane emissions in the oil and natural gas sector. The impact of additional methane emissions on the climate will continue to increase risks to the public and to the New York State economy and environment.

18. Even if, as discussed above, New York State takes its own regulatory actions to achieve additional State-specific methane emission reductions, New York State will still be harmed by the avoidable

emissions of methane from across the United States that will arise as a result of the Rule.

19. According to the United States government[1] and the Intergovernmental Panel on Climate Change,[2] anthropogenic GHG emissions are the primary driver of global climate change. Additionally, the magnitude of future climate change impacts will be primarily determined by the level of continued emissions of well-mixed GHGs, including methane emitted from the oil and natural gas sources implicated by the Rule.

20. New York State is already experiencing the effects of global climate change, and the harms that are already being experienced illustrate the types of harm that New York State will continue to experience as a result of increased nationwide methane emissions attributable to the Rule and EPA's failure to properly utilize its authority

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[1] U.S. Global Change Research Program, *Climate Science Special Report: Fourth National Climate Assessment (NCA4), Vol. I* (2017), *available at* https://science2017.globalchange.gov./chapter/executive-summary/.

[2] Intergovernmental Panel on Climate Change, *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (2015), *available at* https://www.ipcc.ch/report/ar5/wg1/.

to regulate oil and gas methane emissions under Section 111(d) of the Act. The New York State ClimAID assessment[3] provides an overview of the numerous direct impacts that have already been observed in New York State and that are expected through 2100.

21. First, warming ocean water has the potential to strengthen the most powerful storms and contribute to sea level rise. Together, these phenomena are leading to more frequent and extensive coastal flooding. New York State's tidal shoreline, including barrier islands, coastal wetlands, and bays, is expected to be particularly adversely affected by increased sea levels. Sea level in the coastal waters of New York State and up the Hudson River has been steadily rising over the 20th century. Tide-gauge observations in New York indicate that rates of relative sea level rise were significantly greater than the global mean, ranging from 0.9 to 1.5 inches per decade. New York State has approximately 1,850

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[3] Cynthia Rosenzweig et al., *Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation in New York State; Final Report* (2011), *available at* https://www.dos.ny.gov/opd/sser/pdf/ClimAID_Full%20Report.pdf; Radley Horton et al., *Climate Change in New York State: Updating the 2011 ClimAID Climate Risk Information Supplement to NYSERDA Report* 11–18 *(Responding to Climate Change in New York State)* (2014), *available at* http://www.nyserda.ny.gov/climaid.

miles of tidal coastline, and the State owns dozens of state parks within the New York State coastal boundary. Tidal shoreline property in the State held by private landowners is similarly at risk.

22. As an example of the extent of harm caused by warming ocean waters and sea level rise, the twelve inches of sea level rise the New York City area has experienced in the past century exacerbated the flooding caused by Hurricane Sandy by about twenty-five square miles, damaging the homes of an additional eighty thousand people in the New York City area alone.[4] That flooding devastated areas of New York, including the Brooklyn-Queens Waterfront, the East and South Shores of Staten Island, South Queens, Southern Manhattan, and Southern Brooklyn, which in some areas lost power and other critical services for extended periods. Overall, Hurricane Sandy caused fifty-three deaths and the estimated costs of damage and loss in New York State exceeded thirty billion dollars.[5] In the aftermath of Hurricane Sandy, the Federal

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[4] New York Academy of Sciences, *Building the Knowledge Base for Climate Resiliency: New York City Panel on Climate Change 2015 Report* (2015), *available at* https://nyaspubs.onlinelibrary.wiley.com/doi/10.1111/nyas.12593.

[5] FEMA expenditures in New York State totaled 16.9 billion dollars. *See* FEMA, *FEMA Aid Reaches $16.9 Billion for New York's Hurricane*

Emergency Management Agency (FEMA) made 4,127 Public Assistance grants totaling nearly ten billion dollars to State and local governments for facilities damaged by the storm, including parks, beaches, marinas, water treatment plants, hospitals, schools, public housing, and other public buildings. While FEMA grants to New York State covered 90 percent of the eligible costs of such projects, the State was left responsible for covering the remaining 10 percent.[6]

23. New York State has established official state sea level rise projections (6 NYCRR Part 490, Projected Sea-level Rise) based on peer-

Sandy Recovery (Oct. 21, 2015), *available at* https://www.fema.gov/news-release/2015/10/21/fema-aid-reaches-169-billion-new-yorks-hurricane-sandy-recovery. U.S. Department of Housing and Urban Development ("HUD") expenditures totaled 7 billion dollars. *See* HUD Archives News Release No. 13-153 (Oct. 28, 2013), *available at* https://archives.hud.gov/news/2013/pr13-153.cfm. Total insurance payments in New York State totaled 8.3 billion dollars, including National Flood Insurance Program payments and private automobile, homeowner, and commercial property insurance. *See* HUD, *Hurricane Sandy Rebuilding Strategy* (2013), *available at* https://www.hud.gov/sites/documents/hsrebuildingstrategy.pdf.

[6] *See* FEMA, *FEMA Aid Reaches $16.9 Billion for New York's Hurricane Sandy Recovery* (Oct. 21, 2015), *available at* https://www.fema.gov/news-release/2015/10/21/fema-aid-reaches-169-billion-new-yorks-hurricane-sandy-recovery.

reviewed scientific research and which include high projections of seventy-five inches of sea level rise by the year 2100.[7]

24. Climate change is also expected to exacerbate additional harms from both coastal and inland flooding. Increasing flood risk is another impact of climate change that is requiring an increased commitment of State emergency response resources to protect lives and property. Rising air temperatures associated with climate change intensify the water cycle by driving increased evaporation and precipitation. The resulting altered patterns of precipitation include more rain falling in heavy events, often with longer dry periods in between. The United States government has indicated that these risks are particularly likely in the Northeastern United States.[8] Heavy downpours have increased in New York State over the past 50 years. By the end of the 21st century, coastal flood levels currently associated with a 100-year flood could occur approximately four times as often under

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[7] Horton et al. at 10.

[8] U.S. Global Change Research Program, *2014 National Climate Assessment* (2014), *available at https://nca2014.globalchange.gov/report/our-changing-climate/heavy-downpours-increasing*.

conservative sea level rise scenarios.[9] This trend will increase localized flash flooding in urban areas and hilly regions.

25. For example, swift-water or air-rescue teams rescued over one thousand state residents during the flooding caused by Hurricane Irene and Tropical Storm Lee. New York State committed extensive emergency resources in response to these storms, including deploying 1,700 State Police and 3,200 National Guard members, opening 200 shelters to house 18,000 citizens, and staffing 74 Disaster Recovery Centers to assist citizens during the recovery period. The storms closed 400 road segments and bridges and required repairs at 945 locations on the State highway system.[10]

26. New York State is likely to see widespread shifts in species composition in the State's forests and other natural landscapes within the next several decades due to climate change. Losses of spruce-fir forests, alpine tundra and boreal plant communities are expected. Climate change favors the expansion of some invasive species into New

[9] Rosenzweig et al. at 35.

[10] *See generally* New York State, *New York State Responds: Hurricane Irene and Tropical Storm Lee: One Year Later* (Aug. 2012), *available at* https://www.governor.ny.gov/sites/governor.ny.gov/files/archive/assets/documents/Irene-Lee-One-Year-Report.pdf.

York State, such as the aggressive weed kudzu and the insect pest hemlock woolly adelgid. Increased CO_2 in the atmosphere due to climate change is likely to preferentially increase the growth rate of fast-growing species, which are often weeds and other invasives. Lakes, streams, inland wetlands and associated aquatic species will be highly vulnerable to changes in the timing, supply, and intensity of rainfall and snowmelt, groundwater recharge, and duration of ice cover. Increasing water temperatures will negatively affect brook trout and other native cold-water fish.[11]

27. Climate change is expected to hurt agriculture in New York State. Increased summer heat stress will negatively affect cool-season crops, requiring farmers to take adaptive measures such as shifting to more heat-tolerant crop varieties and eventually resulting in a different crop mix for New York State's farmers. The loss of long cold winters could limit the productivity of apples and potatoes because these crops require longer cold dormant periods. New York State's maple syrup industry also requires specific temperature conditions in order for the sugar maples to produce sap. Sugar maple trees will likely be displaced to the north as

[11] Rosenzweig et al. at 165–217.

the climate changes and temperatures increase. Greater weed and pest pressure associated with longer growing seasons and warmer winters will be an increasingly important challenge. Water management will be a more serious challenge for New York State farmers in the future due to the increased frequency of heavy rainfall events and more frequent and intense summer water deficits by mid- to late-century.[12]

28. Dairy farmers will also be impacted by warmer air temperatures associated with climate change. Milk production is maximized under cool conditions ranging from 41°F to 68°F.[13] New York State is the third-largest producer of milk in the United States, behind California and Wisconsin.[14] In 2016, New York State reported approximately $2.5 billion dollars of cash receipts from its dairy industry.[15] A loss of milk production efficiency from heat effects could

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[12] *Id.*

[13] Alvaro Garcia, *Dealing with Heat Stress in Dairy Cows* (2002), *available at* https://www.sdstate.edu/sites/default/files/abe/wri/water-quality/upload/EXEX4024.pdf.

[14] U.S. Department of Agriculture, National Agricultural Statistics Service, *Milk Production, Disposition, and Income: 2017 Summary* (Apr. 2018), *available at* http://usda.mannlib.cornell.edu/usda/current/MilkProdDi/MilkProdDi-04-26-2018.pdf.

[15] *Id.*

result in the loss of hundreds of millions of dollars annually for New York State's dairy industry.

29. New York State's forests and the economy that depends on them also have the potential to be harmed by the increasing emissions of GHGs. Climate change will affect the forest mix in New York State, which could change from the current mixed forest to a temperate deciduous forest. The habitat for existing tree species will decrease as suitable climate conditions shift northward. New York State's Adirondack Park is the largest forested area east of the Mississippi and consists of six million acres including 2.6 million acres of State-owned forest preserve. The Adirondack Park, one the most significant hardwood ecosystems in the world, is likely to be threatened by these changes. These changes will also further impact plant and wildlife species in the Adirondack Park and throughout the State, as the forest composition changes.[16]

30. Demand for health services and the need for public health surveillance and monitoring will increase as the climate continues to change. Heat-related illness and death are projected to increase, while

[16] Rosenzweig et al. at 165-217.

cold-related deaths are projected to decrease. Increases in heat-related death, however, are projected to outweigh reductions in cold-related death. Increased coastal and riverine flooding resulting from intense precipitation could lead to increased stress and mental health impacts, impaired ability to deliver public health and medical services, increased respiratory diseases such as asthma, and increased outbreaks of gastrointestinal diseases.[17] Vector-borne diseases, such as those spread by mosquitoes and ticks (e.g., West Nile virus and Lyme disease), may expand or their distribution patterns may change, either of which may adversely affect additional populations. Water and food-borne diseases are likely to increase without mitigation and adaptation intervention.[18]

31. Finally, climate change is also already exacerbating the direct health impacts of air pollution. New York State has a significant ozone problem largely caused by emissions from sources in upwind states, and climate change is likely to worsen the harms New York State is already suffering from ozone. As the United States government points out, the hottest days in the Northeastern states are associated with high

[17] *Id.* at 421.
[18] *Id.* at 403.

concentrations of ground-level ozone and other pollutants.[19] Exposure to ozone has also been linked to premature mortality and a variety of health problems,[20] including chest pain, coughing, throat irritation, airway inflammation, reduced lung function, and damaged lung tissue. Ozone can worsen bronchitis, emphysema, and asthma, leading to increased medical costs.

32. Each of these and other harms to New York State from climate change will be exacerbated by the Rule, including by EPA's position that the Rule removes its obligation to promulgate guidelines for regulating methane emissions from existing sources in the oil and natural gas sector under Section 111(d) of the Act. These harms result from the increases in nationwide methane emissions that will result from the Rule, the increased need for and cost of State actions to further reduce GHG emissions and achieve its statutory requirements under the CLCPA, and the likelihood of increased GHG emissions leakage.

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[19] U.S. Global Change Research Program, *2014 National Climate Assessment* (2014), *available at* https://nca2014.globalchange.gov/report/regions/northeast#narrative-page-16959.

[20] *See* EPA, Climate Adaptation: Ground-Level Ozone and Health, https://www.epa.gov/arc-x/climate-adaptation-ground-level-ozone-and-health (last accessed Nov. 7, 2018).

I declare under penalty of perjury that the foregoing is true and correct.

Executed in Albany, New York on September 15, 2020.

Jared Snyder
Deputy Commissioner for Climate Change, Air and Energy
New York State Department of Environmental Conservation

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

STATE OF CALIFORNIA, *et al.*, *Petitioners*, v. ANDREW R. WHEELER, in his official capacity as Administrator, United States Environmental Protection Agency, *et al.*, *Respondents*.	No. 20-1357 (and consolidated cases)

DECLARATION OF ERICA FLEISHMAN

I, Erica Fleishman, declare as follows:

1. I serve as director of the Oregon Climate Change Research Institute (OCCRI), which is housed at the College of Earth, Ocean, and Atmospheric Sciences at Oregon State University.

2. I submit this declaration in support of the State Petitioners' Emergency Motion For A Stay Pending Review of the final action of the United States Environmental Protection Agency, "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review," published at 85 Fed. Reg. 57,018 (September 14, 2020) (Rescission Rule). I make this declaration on the basis of my own personal knowledge, unless otherwise indicated.

PERSONAL BACKGROUND AND QUALIFICATIONS

3. I received a BS and MS in Biological Sciences from Stanford University in 1991 and 1992, respectively, and a PhD in Ecology, Evolution, and Conservation Biology from University of Nevada, Reno in 1997. I have 30 years of experience in assessing the effects of climate and other types of environmental variability, extremes, and change on natural and human-dominated ecosystems in the western United States. Since 2012 I have served as a co-principal investigator of the Southwest Climate Adaptation Science Center, one of eight such regional centers across the United States. These centers develop data and tools to address the climate change-related information needs of managers of species, ecosystems, and the human communities they support.

4. OCCRI was created in 2007 by the Oregon State Legislature under House Bill 3543. Among OCCRI's charges from the Legislature is "assess[ment of]… the state of climate change science, including biological, physical and social science, as it relates to Oregon and the likely effects of climate change on the state." The *Fourth Oregon Climate Assessment Report* (http://www.occri.net/publications-and-reports/fourth-oregon-climate-assessment-report-2019/), which was authored by OCCRI scientists and collaborators, was released in January 2019. OCCRI scientists also contributed to the Northwest chapter of the Fourth National Climate Assessment (https://nca2018.globalchange.gov/chapter/24/) and produced the Oregon Climate Change Effects, Likelihood, and Consequences Workshop report (2019; http://www.occri.net/publications-and-reports/oregon-climate-change-risk-workshop/). These and previous Oregon Climate Assessment reports, other publications in the peer-reviewed literature, and a limited amount of personal communication from agencies of the

State of Oregon form the basis for this declaration.

5. I am making this declaration in my personal capacity on the basis of my expertise, experience, and training, and not on behalf of Oregon State University.

CLIMATE CHANGE IN OREGON AND ASSOCIATED RISKS

6. Global increases in concentrations of greenhouse gases are changing climate worldwide. Not only are average values of annual temperature and, in some cases, precipitation and wind changing; but the incidence of extreme temperature, precipitation, and other forms of extreme climate is increasing; and climate is becoming less predictable. Oregon's residents may benefit from some of these changes, but many of the changes also directly or indirectly threaten their physical and mental health and economic and social well-being. Disasters may result not only from isolated events but from recurrent events that individually are not extreme, but degrade a community's infrastructure (Field et al. 2012[1]).

7. The Pacific Northwest has warmed by about 2˚F since 1900. Average temperatures in Oregon are projected to increase by another 2–7°F by 2100, depending on the global level of greenhouse gas emissions. Hot days and warm nights are likely to become more frequent. Extreme heat poses risk to human health, especially among those who work or live outdoors, the elderly, those with underlying health conditions, and economically disadvantaged communities, and can stress local emergency healthcare systems. As noted below, there also is evidence that the incidence of some infectious diseases, such as Lyme disease, West Nile virus, and salmonella, increase as average temperatures increase or

[1] Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Medgley, editors. 2012. Managing the risks of extreme events and disasters to advance climate change adaptation. A special report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom.

during heat waves.

8. Oregon's annual snowpack is decreasing as the proportion of precipitation falling as rain increases and snowmelt occurs earlier. As a result, autumn and winter runoff is projected to increase across Oregon, increasing the probability of seasonal flooding and landslides that can threaten human lives, private property, and infrastructure such as roads and other transportation corridors (see below). Additionally, the runoff associated with extreme precipitation may introduce human-made or naturally occurring toxins into the domestic water supply. Spring and summer runoff are likely to decrease, and vulnerability to water shortages to increase, in western and northeastern Oregon. Decreases in water availability may decrease the quality and quantity of water available for domestic consumption and use, including but not limited to drinking, cooking, washing, and bathing.

9. Projected changes in climate in both the short term and the long term contribute to changes in fire dynamics in Oregon and beyond. Across the United States, changes in fire dynamics are leading to losses of human life and property, and to substantial financial costs. In California, for example, the damages associated with wildfires in 2018 alone exceeded $20 billion (Smith 2019[2]). Nationwide, the damages associated with wildfires in 2017 and 2018 were greater than $40 billion (Smith 2019). Shifts in fire dynamics often reflect interactions among historic fire suppression; changes in vegetation structure and composition, including the introduction of non-native invasive grasses that are highly flammable (Brooks et al.

[2] Smith, A.B. 2019. 2018's billion dollar disasters in context. https://www.climate.gov/news-features/blogs/beyond-data/2018s-billion-dollar-disasters-context, accessed December 2019.

2004[3], Fusco et al. 2019[4]); the increasing role of humans in igniting wildfires (Balch et al. 2017[5]); and changes in climate and fire weather.

10. The human costs of wildfires are considerable. For example, high levels of fine particulate matter are associated with respiratory illness in humans and other animals, especially in individuals with compromised respiratory systems, and with reductions in outdoor exercise (Evans 2019[6]). To illustrate, on a peak smoke day during the 2017 Eagle Creek fire, the Oregon Health Authority reported a 20% increase in emergency room visits for respiratory symptoms in the Portland metropolitan region (OHA 2017[7]). Short-term exposure to fine particulate matter from smoke also has been linked to increases in violent crime, especially assaults (Burkhardt et al. 2019[8]). The number of days on which the air quality index (AQI) was poor for all groups (AQI categories unhealthy, very unhealthy, or hazardous) in many Oregon municipalities as a result of wildfire smoke increased considerably in recent years (DEQ 2018)[9]. For example, the AQI in Medford was poor due to wildfire smoke for a total of 28 days from 1985–2014, primarily in 1987 (16 days). By contrast, from 2015–2018, Medford's AQI was poor due to wildfire smoke for a total of 46 days: 7 in 2015, 14 in 2017,

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[3] Brooks, M.L., C.M. D'Antonio, D.M. Richardson, J.B. Grace, J.E. Keeley, J.M. DiTomaso, R.J. Hobbs, M. Pellant, and D. Pyke. 2004. Effects of invasive alien plants on fire regimes. BioScience 54:677–688.

[4] Fusco, E.J., J.T. Finn, J.K. Balch, R.C. Nagy, and B.A. Bradley. 2019. Invasive grasses increase fire occurrence and frequency across US ecoregions. Proceedings of the National Academy of Sciences of the United States 116:23594–23599.

[5] Balch, J.K., B.A. Bradley, J.T. Abatzoglou, R.C. Nagy, E.J. Fusco, and A.L. Mahood. 2017. Human-started wildfires expand the fire niche across the United States. Proceedings of the National Academy of Sciences of the United States 114:2946–2951.

[6] Evans, G.W. 2019. Projected behavioral impacts of global climate change. Annual Review of Psychology 70:449–474.

[7] Oregon Health Authority (OHA). 2017. Statewide fire activation surveillance report (090517-090617).

[8] Burkhardt, J., J. Bayham, A. Wilson, J. Berman, K. O'Dell, B. Ford, E.V. Fischer, and J.R. Pierce. 2019. The relationship between air pollution and violent crime across the United States. Journal of Environmental Economics and Policy. https://doi.org/10.1080/21606544.2019.1630014.

[9] State of Oregon Department of Environmental Quality (DEQ). 2018. Wildfire smoke trends and associated health risks, Bend, Klamath Falls, Medford and Portland – 1985 to 2018. https://www.oregon.gov/deq/FilterDocs/smoketrends.pdf, accessed March 2019.

and 25 in 2018. Portland's AQI was not affected by wildfire smoke from 1985–2014, but smoke resulted in a poor AQI in the city on five days from 2015–2018. Moreover, smoke-driven reductions in air quality in Oregon are affecting regional economies. For example, *The New York Times* reported that in 2018, the Oregon Shakespeare Festival in Ashland estimated losses of $2 million as a result of cancelled performances and reduced attendance due to wildfire smoke[10].

11. The Oregon Health Authority (OHA), drawing on data on air quality, emergency department visits, and hospitalizations in areas affected by wildfire smoke, can estimate certain health care costs for diseases and conditions known to be caused or exacerbated by exposure to particulate matter.

12. The OHA estimates that smoke from the Chetco Bar Fire and other wildfires that affected central and southwestern Oregon (1.1 million residents) during two months in late summer 2017 resulted in 207 excess emergency department visits and 18 excess hospitalizations for asthma, at a cost of $556,000.

13. The OHA estimates that smoke from the 2017 Eagle Creek Fire in the Columbia River Gorge (2 million residents in seven counties) resulted in 96 excess emergency department visits and 9 excess hospitalizations for asthma, at a cost of $529,000.

14. Climate change, including the effects of wildfires that are driven in part by climate change, is expected to have continuing negative effects on the health of Oregonians. The cost of those negative effects, in turn, will increase burdens on the state's budget. The OHA, relying primarily on the Oregon All Payer Claims Database, estimates that about 13% of all

[10] The New York Times. 24 August 2018. Wildfire smoke disrupts Oregon Shakespeare Festival. https://www.nytimes.com/2018/08/24/theater/oregon-shakespeare-festival-wildfire-smoke.html

Oregon health care costs are borne by the state. In addition to the health effects of wildfire smoke and extreme heat, climate change may increase Oregonians' exposure to vector-borne diseases. For example, above-average temperatures were associated with expansion of West Nile virus from the eastern to the western United States (Reisen et al. 2006)[11]. As summer becomes longer and warmer, the incidence of West Nile virus, and other viral infections that cause brain inflammation, may increase (Bethel et al. 2013)[12]. Additionally, as water temperatures in oceans and estuaries in the Northwest increase, so may the incidence of *Vibrio parahaemolyticus* infections, which are caused by consuming raw oysters or other shellfish that are infected with the bacterium (Bethel et al. 2013)[12]. Exposure to and incidence of other water-borne diseases, especially cryptosporidosis, may increase as precipitation and flooding in Oregon increase (Bethel et al. 2013)[12]. High flows can carry cattle feces into recreational waters and sources of drinking water, resulting in cryptosporidosis and other gastrointestinal illnesses in humans.

15. Climate change is likely to reduce some Oregonians' access to sufficient and nutritious food[12], which in turn poses risks to physical and mental health, maternal health, and child development (Schnitter and Berry 2019)[13]. Mechanisms by which food security may be affected include droughts and floods within or beyond the region; both can affect agricultural production, and floods and landslides can affect the infrastructure used to transport food. Individuals, populations, and communities that have low incomes, are

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[11] Reisen, W.K., Y. Fang, and V.M. Martinez. 2006. Effects of temperature on the transmission of West Nile virus by *Culex tarsalis* (Diptera: Culicidae). Journal of Medical Entomology 43:309–317.

[12] Bethel, J., S. Ranzoni, and S.M. Capalbo. 2013. Human health: impacts and adaptation. Pages 181 – 206 in Dalton, M., P.W. Mote, and A.K. Snover. 2013. Climate change in the Northwest: implications for our landscapes, waters, and communities. Island Press, Washington, D.C.

[13] Schnitter, R., and P. Berry. 2019. The climate change, food security, and human health nexus in Canada: a framework to protect population health. International Journal of Environmental Research and Public Health 16:2531. doi:10.3390/ijerph16142531.

relatively isolated, or are in poor health may be especially vulnerable to climate change-induced food insecurity. Given the role that certain foods play in tribal communities in Oregon and elsewhere, not only health but cultural values and identity are threatened by some elements of climate change and related food access (Quaempts et al. 2018)[14].

16. Mental health of Oregonians also is likely to be adversely affected by climate change. For example, extreme events that are caused in part by climate change, such as wildfires or floods, can displace people from their homes either temporarily or permanently and degrade social and economic infrastructure (Bethel et al. 2013)[12]. Similar effects on social and economic systems may result from recurrent events even if the individual events are not extreme (Field et al. 2012)[15]. Heat waves have been associated with increases in violent criminal activity during the following week in jurisdictions across the United States (Jacob et al. 2007)[16], and increases in larceny and violent crime are projected to increase as maximum monthly temperatures increase (Ranson 2014)[17].

17. As climate, fuel loads, and associated fire dynamics change, the cost of fire suppression in Oregon is increasing. The average number of acres that burned in Oregon increased from 11,600 from 1990–1999 to 41,700 from 2010–2019 (GCWR 2019[18]). The direct costs of fire suppression on lands protected by the Oregon Department of Forestry increased from an

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[14] Quaempts, E.J., K.L. Jones, S.J. O'Daniel, T.J. Beechie, and G.C. Poole. 2018. Aligning environmental management with ecosystem resilience: a First Foods example from the Confederated Tribes of the Umatilla Indian Reservation, Oregon, USA. Ecology and Society 23(2):29. doi:10.5751/ES-10080-23029.

[15] Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Medgley, editors. 2012. Managing the risks of extreme events and disasters to advance climate change adaptation. A special report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom.

[16] Jacob, B., L. Lefgren, and E. Moretti. 2007. The dynamics of criminal behavior: evidence from weather shocks. Journal of Human Resources 42:489–527.

[17] Ranson, M. 2014. Crime, weather, and climate change. Journal of Environmental Economics and Management 67:274–302.

[18] [Oregon] Governor's Council on Wildfire Response (GCWR), Report and Recommendations, November 2019. https://www.oregon.gov/gov/policy/Documents/FullWFCReport_2019.pdf.

average of $9.7 million per year from 2006–2012 to $62.4 million from 2013–2019. (GCWR 2019). Across the western United States, including the Pacific Northwest, the duration of the fire season is increasing. In the Pacific Northwest, the duration of the fire season more than quadrupled, from an average of 23 days to an average of 116 days, from the 1970s to the 2000s. Across the western United States, roughly half of the observed increase in fuel aridity and more than 16,000 square miles of burned area from 1984–2015 were attributed to human-caused climate change.

18. Rising sea levels, coastal erosion, ocean acidification, and an increase in the frequency of harmful algal blooms will continue to threaten private property and subsistence, recreational, and commercial fisheries, including but not limited to shellfish fisheries, in Oregon. Sea level rise could drive saltwater intrusion into coastal aquifers from which water for domestic and agricultural uses is derived. Additionally, extreme winter storms increase storm surge, erosion, and the likelihood of flooding in coastal communities.

19. Transportation systems in Oregon are threatened by extreme precipitation and temperatures, sea level rise, and wildfires, all of which damage roads to the point that closures are necessary (OLIS 2019[19]). Current levels of funding are not sufficient for the Oregon Department of Transportation to proactively clear drainages (reducing the risk of flood), reshape slopes (reducing the risk of landslides), and maintain roadside vegetation (reducing the risk of flood and fire) (OLIS 2019). Additional funding also is necessary to ensure rapid responses to natural disasters and to upgrade transportation infrastructure.

20. Native American tribes both on and off reservations generally are among the communities

[19] Oregon State Legislature, Oregon Legislative Information (OLIS). 2019. An adaptation menu of investment options: potential transportation investments to adapt to climate change impacts. Committee meeting document. https://olis.leg.state.or.us/liz/2019R1/Downloads/CommitteeMeetingDocument/165202.

most strongly and adversely affected by climate change. Climate change affects the lands, identity, economies, physical and mental health, and culture of Native American tribes in addition to tribal fisheries and other sources of traditional foods, including but not limited to salmon, shellfish, and berries. In 2015, 15 tribes in the Columbia River Basin and three intertribal organizations identified protection of water quality and quantity; fishes, their habitats, and connectivity among them; preparation for wildfires in forests; and wildlife and their habitat among their highest priorities for climate action plans[20].

I state under penalty of perjury under the laws of the United States of America that the foregoing is true and correct to the best of my knowledge and belief.

Executed in Corvallis, Oregon on September 14, 2020.

Erica Fleishman

Erica Fleishman

Director, Oregon Climate Change Research Institute

[20] Sampson, D. 2015. Columbia River Basin tribes climate change capacity assessment. Portland State University, Portland, Oregon. https://www.tribalclimatecamp.org/sites/default/files/ColBasinTribes_CCCassessment.pdf

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

STATE OF CALIFORNIA, *et al.*, *Petitioners*, v. ANDREW R. WHEELER, in his official capacity as Administrator, United States Environmental Protection Agency, *et al.*, *Respondents*.	No. 20-1357 (and consolidated cases)

DECLARATION OF KATHY TAYLOR

I, Kathy Taylor, state and declare as follows:

1. I submit this declaration in support of the State Petitioners' Emergency Motion For A Stay Pending Review of the final action of the United States Environmental Protection Agency entitled "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review," published at 85 Fed. Reg. 57,018 (September 14, 2020) (Rescission Rule). I make this declaration of my own personal knowledge, unless otherwise indicated.

2. I serve as the Program Manager for the Air Quality Program at the Washington State Department of Ecology. I have worked for the State of

Washington for twenty years. I have served as Manager of the Air Quality Program for one year. Prior to serving as Air Quality Program Manager, I served as the Deputy Program Manager of the Air Quality Program for approximately 3 years.

3. In my role as Manager of the Air Quality Program, I oversee the development of rules, regulations, and programs for meeting state and federal requirements related to air quality, including air quality monitoring, permitting and compliance. I am responsible for coordinating the Air Quality Program's efforts to develop strategies to reduce emissions of greenhouse gases and combat climate change, including implementing recent state legislation addressing hydrofluorocarbons and the Clean Energy Transformation Act.

Climate Change in Washington and Associated Risks

4. Washington is a coastal state, a mountain state, and a forest state. Reports prepared by the University of Washington Climate Impacts Group show that climate change will significantly adversely affect each of these signature resources of the State of Washington. In addition to these impacts, climate change will cause significant harm to public health.

5. Approximately 4 million of Washington's over 7 million people live in the area around Puget Sound. Sixty-eight percent of Washington's population live in coastal counties. Climate change will cause the sea level to rise and permanently inundate low-lying areas in the Puget Sound region. Under a high

greenhouse gas scenario, sea level is projected to rise in Seattle by as much as 1.5 feet by 2050, and 5.1 feet by 2100, relative to 1991-2009 sea levels. Sea level rise will also increase the frequency of coastal flood events. For example, the current 1-in-100 year flood in Seattle will become a 1-in-10 year flood with 1 foot of sea level rise, and will become an annual event with 2 feet of sea level rise. Sea level rise will also cause coastal bluffs (the location of many family homes in Puget Sound) to recede by as much as 75-100 feet by 2100 relative to 2000. This would be a doubling, on average, of the current rate of recession, and would cause significant damage to state properties, tourism, and public infrastructure, and increased demands for emergency services. The impacted areas include diverse ecosystems (e.g., sandy beaches, islands, estuaries, and salt marshes) that offer significant recreational, cultural, and aesthetic value to residents and visitors to the State of Washington, as well as provide crucial ecological functions that support wildlife and aquatic habitats. Sea level rise will also result in reduced harvest for commercial fishing and shellfish operations.

6. Climate change is also causing ocean acidification, through the absorption in the ocean of excess carbon dioxide from the atmosphere. Ocean waters on the outer coast of Washington and the Puget Sound have become about 10-40% more acidic since 1800. This increased acidity is already affecting some shellfish species. Washington has the largest shellfish industry on the west coast,

contributing $184 million to Washington's economy in 2010 and employing 2710 workers. Under a business as usual greenhouse gas scenario, ocean waters are expected to become at least 100% more acidic by 2100 relative to 1986-2005. The predicted level of ocean acidification is expected to cause a 34% decline in shellfish survival by 2100, impacting the state economy, as well as state revenues.

7. Washington depends on yearly winter mountain snow pack for drinking water, as well as water for irrigation, hydropower, and salmon. Washington's winter mountain snowpack is decreasing because climate change is causing more precipitation to fall as rain rather than snow. Snow pack decreased in Washington's Cascade Mountains by about 30% between the mid-20th century and 2016. By the 2050s, snow pack is predicted to decrease 38-46%, and by the 2080s snow pack is expected to decline 56%-70% relative to 1970-1999. This loss of snow pack will cause a 50% increase in the number of years in which water is not available for irrigation, as well as a 20% decrease in summer hydropower production. In addition, the decrease in summer stream flows combined with higher stream temperatures will result in stream temperatures too high to support adult salmon.

8. Climate change is also impacting Washington's forests. Of Washington's total area (42.5 million acres), a little more than half (22 million acres) is forested. Washington's forest products industry generates a gross income

of about $48 billion per year, provides more than 100,000 jobs, and contributes approximately $4.9 billion in annual wages. Climate change is threatening this industry in a number of ways. For example, Douglas fir accounts for almost half the timber harvested in Washington. Under a moderate greenhouse gas scenario, Douglas fir habitat is expected to decline 32% by the 2060s relative to 1961-1990. In addition, the area of Washington forest where tree growth is severely limited by water availability is projected to increase (relative to 1970-1999) by about 32% in the 2020s, with an additional 12% increase in the 2040s and another 12% increase in the 2080s. Wildland fires pose another threat to Washington's forests. Under a business as usual greenhouse gas scenario, decreases in summer precipitation, increases in summer temperatures and earlier snow melt are predicted to result in up to a 300% increase in the area in eastern Washington burned annually by forest fires and up to a 1000% increase in area burned annually on the west side of the state (typically, the wet side). Between 2010 and 2019, the Washington Department of Natural Resources expended over $600 million in fire suppression efforts, with $114 million expended in 2019 alone. These costs will only continue to climb as the frequency and intensity of climate-change-fueled wildfires increase throughout Washington State.

9. By far the highest costs to the state, however, are expected to come from harm to public health. More frequent heat waves and more frequent and

intense flooding are likely to increase hospitalizations, deaths, and demand for emergency services. Warming may also exacerbate health risks from poor air quality and allergens, including increases in ground-level ozone, which are expected to lead to increased deaths. Risks are often greatest for the elderly, children, those with existing chronic health conditions, individuals with greater exposure to outside conditions, and those with limited access to health resources.

I state under penalty of perjury under the laws of the United States of America that the foregoing is true and correct to the best of my knowledge and belief.

Executed on September 17, 2020 in Lacey, Washington.

KATHY TAYLOR

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- Washington: A Shellfish State, Washington Shellfish Initiative, at http://www.governor.wa.gov/sites/default/files/WSI%20factsheet.pdf
- Coastal Hazard Resilience Network, "Sea Level Rise: Research and Tools" at https://wacoastalnetwork.com/chrn/research/sea-level-rise/.

XAVIER BECERRA
Attorney General

State of California
DEPARTMENT OF JUSTICE

300 SOUTH SPRING STREET, SUITE 1702
LOS ANGELES, CA 90013

Public: (213) 269-6000
Telephone: (213) 269-6438
Facsimile: (213) 897-2802
E-Mail: Caitlan.McLoon@doj.ca.gov

September 15, 2020

VIA EMAIL AND OVERNIGHT MAIL

Administrator Andrew Wheeler
Office of the Administrator, Code 1101A
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

RE: Request for Stay of *Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review* and *Oil and Natural Gas Sector: Emission Standards for New, Reconstructed and Modified Sources Reconsideration*

Dear Administrator Wheeler:

The Attorneys General of California, Colorado, Connecticut, Delaware, Illinois, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Jersey, New Mexico, New York, North Carolina, Oregon, Pennsylvania, Rhode Island, Vermont, Virginia, and Washington, the California Air Resources Board and the Colorado Department of Public Health and Environment, and the City of Chicago, the City and County of Denver, and the District of Columbia (collectively, "States and Cities") write to respectfully request that you immediately stay, pending review, the final action titled Oil and Natural Gas Sector Emission Standards for New, Reconstructed, and Modified Sources Review published in the Federal Register at 85 Fed. Reg. 57,018 (Sept. 14, 2020) ("Review Rule") and the final action titled Oil and Natural Gas Sector: Emission Standards for New, Reconstructed and Modified Sources Reconsideration published in the Federal Register at 85 Fed. Reg. 57,398 (Sept. 15, 2020) ("Reconsideration Rule") (collectively "Rules"). We make this request pursuant to 5 U.S.C. § 705.

The Rules are contrary to law, arbitrary and capricious, and clearly violate your obligations under the Clean Air Act as Administrator of the Environmental Protection Agency to safeguard Americans' health and welfare. Through these Rules, EPA significantly increases emissions of methane, volatile organic compounds, and hazardous air pollutants. In so doing, EPA ignores its own legal and factual findings that the oil and natural gas sector is the largest industrial source of methane in the United States; that methane is a potent greenhouse gas (GHG); that the oil and natural gas sector contributes significantly to air pollution that may reasonably be anticipated to endanger public health or welfare; that methane emission from the oil and natural gas sector should be directly addressed through the best system for their reduction; and that marginal wells are a significant source of emissions. If EPA does not stay the Rules, the States and Cities will face irreparable harm from the increase in emissions of methane, volatile organic compounds ("VOCs"), and hazardous air pollutants. VOCs are a chemical precursor to ozone formation, and exposure to ozone poses a significant threat to public health, particularly the health of vulnerable populations including children, older adults, and those suffering from chronic lung disease and asthma. And, the federal government's own scientists have underscored the overwhelming evidence of the environmental, public health, economic, and national security impacts of climate change resulting from anthropogenic emissions of GHGs, including methane. The States and Cities have a demonstrated, legally protected interest in protecting our residents from harmful air pollution that contributes to climate change and endangers public health and welfare, and the Rules will directly impact our efforts to implement greenhouse gas and ozone control measures. A stay of the Rules is thus both appropriate and legally required.

As the States and Cities previously pointed out in comments submitted to EPA urging the agency not to adopt these Rules, which rescind and weaken critical protections from pollution in the oil and natural gas industry, the Rules fail to pass legal muster as follows:

- The Review Rule is unlawful because it removes the transmission and storage segment from the source category. EPA appropriately interpreted the original listing of the oil and natural gas source category to broadly cover the natural gas industry given the interrelated nature of the operations, equipment, and emissions.

- The Review Rule is also unlawful under the Clean Air Act and arbitrary and capricious because it rescinds the regulation of methane from the remainder of the source category. Based on the extensive rulemaking record for the EPA's 2016 emission standards for new, reconstructed, and modified sources in the oil and natural gas sector codified at 40 Code of Federal Regulations part 60, subpart OOOOa ("2016 Standard"),[1] EPA was correct to regulate methane.

- The Review Rule is arbitrary and capricious for failing to justify EPA's change of position in light of that record. EPA's claim that these standards are "redundant" with standards for volatile organic compounds is baseless, not least because this explanation fails to adequately consider the implications of its action on *existing* sources in the oil and natural gas industry. EPA acknowledges that methane standards for new sources trigger EPA's obligation to regulate methane emissions from existing sources, which constitute the majority of methane emissions from this source category. EPA fails to adequately or rationally analyze and account for that effect of the Review Rule.

- Further, the Review Rule's alternative new interpretation of section 111(b) of the Clean Air Act is contrary to the statute. EPA is not required to make a pollutant-specific

[1] 81 Fed. Reg. 35,824 (June 3, 2016).

significant contribution finding for GHG emissions, or for methane specifically, from the oil and natural gas source category as a prerequisite to regulating those emissions. EPA has failed to provide adequate justification for departing from its long-standing statutory interpretation as set forth in the rulemaking record for the 2016 Standard. And EPA's reliance on significance criteria that will be the subject of some future rulemaking does not provide a reasoned explanation and creates unexplained inconsistencies.

- Finally, the Reconsideration Rule weakens the remaining standards from sources in the production and processing segments by excluding marginal wells from regulation without a reasoned basis and contrary to the evidence before the agency. While the Reconsideration Rule acknowledges that the cost of retaining the prior standards is within a reasonable range, it nonetheless relaxes those requirements. Such an action is arbitrary and capricious. Nor was it appropriate for EPA to adopt changes that were not noticed or evaluated in the proposed rule.

For the reasons stated above, the States and Cities undersigned here respectfully ask that you stay the Rules immediately, and maintain the protections provided by the 2016 Standard.

The Office of the Attorney General for the State of California is lead contact for the signatories. You can contact Caitlan McLoon at Caitlan.McLoon@doj.ca.gov or (213) 269-6438 to further discuss this request.

Sincerely,

Caitlan McLoon
Deputy Attorney General

For XAVIER BECERRA
Attorney General

CALIFORNIA AIR RESOURCES BOARD

FOR THE STATE OF COLORADO

PHILIP J. WEISER
Attorney General
ERIC R. OLSON
Solicitor General
SCOTT STEINBRECHER
Assistant Deputy Attorney General
Natural Resources and Environment Section
Colorado Department of Law
1300 Broadway, 10th Floor
Denver, Colorado 80203
Tel: (720) 508-6548
Eric.Olson@coag.gov
Attorneys for Petitioner State of Colorado, by and through its Attorney General Philip J. Weiser, and Colorado Department of Public Health and Environment

FOR THE STATE OF CONNECTICUT

WILLIAM TONG
Attorney General
JILL LACEDONIA
Assistant Attorney General
Connecticut Office of the Attorney General
165 Capitol Avenue
Hartford, CT 06106
Tel: (860) 808-5250
Jill.Lacedonia@ct.gov
Attorneys for Petitioner State of Connecticut

FOR THE STATE OF DELAWARE

KATHLEEN JENNINGS
Attorney General
CHRISTIAN DOUGLAS WRIGHT

Director of Impact Litigation
VALERIE EDGE
Deputy Attorney General
JAMESON A.L. TWEEDIE
Special Assistant Deputy Attorney General
Delaware Department of Justice
820 N. French Street
Wilmington, DE 19801
Tel: (302) 577-8600
Christian.Wright@delaware.gov
Valerie.Edge@delaware.gov
Jameson.Tweedie@delaware.gov
Attorneys for Petitioner State of Delaware

FOR THE STATE OF ILLINOIS

KWAME RAOUL
Attorney General
MATTHEW J. DUNN
Chief, Environmental Enforcement/Asbestos Litigation Division
DANIEL I. ROTTENBERG
JASON E. JAMES
Assistant Attorneys General
69 W. Washington Street, 18th Floor
Chicago, IL 60602
Tel: (312) 814-3816
drottenberg@atg.state.il.us
Attorneys for Petitioner State of Illinois

FOR THE STATE OF MAINE

AARON M. FREY
Attorney General
LAURA E. JENSEN
Assistant Attorney General
Office of the Attorney General

6 State House Station
Augusta, ME 04333
Tel: (207) 626-8868
Laura.Jensen@maine.gov
Attorneys for Petitioner State of Maine

FOR THE STATE OF MARYLAND

BRIAN E. FROSH
Attorney General
JOSHUA M. SEGAL
Special Assistant Attorney General
200 St. Paul Place
Baltimore, MD 21202
Tel: (410) 576-6446
jsegal@oag.state.md.us
Attorneys for Petitioner State of Maryland

FOR THE COMMONWEALTH OF MASSACHUSETTS

MAURA HEALEY
Attorney General
MELISSA HOFFER
Chief, Energy and Environment Bureau
Office of the Attorney General
One Ashburton Place, 18th Floor
Boston, MA 02108
Tel: (617) 727-2200
Melissa.Hoffer@mass.gov
Attorneys for Petitioner Commonwealth of Massachusetts

FOR THE PEOPLE OF THE STATE OF MICHIGAN

DANA NESSEL
Attorney General

ELIZABETH MORRISSEAU
Assistant Attorney General
Environment, Natural Resources, and Agriculture Division 6th Floor
G. Mennen Williams Building
525 W. Ottawa Street
P.O. Box 30755
Lansing, MI 48909
Tel: (517) 335-7664
MorrisseauE@michigan.gov
Attorneys for Petitioner People of the State of Michigan

FOR THE STATE OF MINNESOTA

KEITH ELLISON
Attorney General of Minnesota
PETER N. SURDO
Special Assistant Attorney General
445 Minnesota Street Suite 900
Saint Paul, MN 55101
Tel: (651) 757-1061
Peter.Surdo@ag.state.mn.us
Attorneys for Petitioner State of Minnesota

FOR THE STATE OF NEW JERSEY

GURBIR S. GREWAL
Attorney General
LISA MORELLI
Deputy Attorney General
25 Market St., PO Box 093
Trenton, NJ 08625-0093
Tel: (609) 376-2745
Lisa.Morelli@law.njoag.gov
Attorneys for Petitioner State of New Jersey

FOR THE STATE OF NEW MEXICO

HECTOR BALDERAS
Attorney General of New Mexico
WILLIAM GRANTHAM
Assistant Attorney General
201 Third Street NW, Suite 300
Albuquerque, New Mexico 87102
Tel: (505) 717-3520
wgrantham@nmag.gov
Attorneys for Petitioner State of New Mexico

FOR THE STATE OF NEW YORK

LETITIA JAMES
Attorney General
BARBARA D. UNDERWOOD
Solicitor General
STEVEN C. WU
Deputy Solicitor General
MORGAN A. COSTELLO
MICHAEL J. MYERS
Assistant Attorneys General
Office of the Attorney General
The Capitol
Albany, NY 12224
Tel: (518) 776-2392
morgan.costello@ag.ny.gov
Attorneys for Petitioner State of New York

FOR THE STATE OF NORTH CAROLINA
JOSHUA H. STEIN
Attorney General
DANIEL S. HIRSCHMAN
Senior Deputy Attorney General

ASHER P. SPILLER
TAYLOR H. CRABTREE
Assistant Attorneys General
North Carolina Department of Justice
P.O. Box 629
Raleigh, NC 27602
Tel: (919) 716-6400
aspiller@ncdoj.gov
tcrabtree@ncdoj.gov
Attorneys for Petitioner State of North Carolina

FOR THE STATE OF OREGON

ELLEN F. ROSENBLUM
Attorney General
PAUL GARRAHAN
Attorney-in-Charge
STEVE NOVICK
Special Assistant Attorney General
Natural Resources Section
Oregon Department of Justice
1162 Court Street NE
Salem, OR 97301-4096
Tel: (503) 947-4593
Paul.Garrahan@doj.state.or.us
Steve.Novick@doj.state.or.us
Attorneys for Petitioner State of Oregon

FOR THE COMMONWEALTH OF PENNSYLVANIA

JOSH SHAPIRO
Attorney General
MICHAEL J. FISCHER
Chief Deputy Attorney General
ANN R. JOHNSTON
Senior Deputy Attorney General

Office of Attorney General
1600 Arch St. Suite 300
Philadelphia, PA 19103
Tel: (215) 560-2171
ajohnston@attorneygeneral.gov
Attorneys for Petitioner Commonwealth of Pennsylvania

FOR THE STATE OF RHODE ISLAND

PETER F. NERONHA
Attorney General
GREGORY S. SCHULTZ
Special Assistant Attorney General
Rhode Island Office of Attorney General
150 South Main Street
Providence, RI 02903
Tel: (401) 274-4400
gschultz@riag.ri.gov
Attorneys for Petitioner State of Rhode Island

FOR THE STATE OF VERMONT

THOMAS J. DONOVAN, JR.
Attorney General
NICHOLAS F. PERSAMPIERI
Assistant Attorney General
Office of the Attorney General
109 State Street
Montpelier, VT 05609
Tel: (802) 828-3171
nick.persampieri@vermont.gov
Attorneys for Petitioner State of Vermont

FOR THE COMMONWEALTH OF VIRGINIA

MARK R. HERRING
Attorney General
PAUL KUGELMAN, JR.
Senior Assistant Attorney General
Chief, Environmental Section
CAITLIN C. G. O'DWYER
Assistant Attorney General
Office of the Attorney General
Commonwealth of Virginia
202 North 9th Street
Richmond, VA 23219
Tel: (804) 786-1780
godwyer@oag.state.va.us
Attorneys for Petitioner Commonwealth of Virginia

FOR THE STATE OF WASHINGTON

ROBERT W. FERGUSON
Attorney General
EMILY C. NELSON
Assistant Attorney General
Office of the Attorney General
P.O. Box 40117
Olympia, WA 98504
Tel: (360) 586-4507
emily.nelson@atg.wa.gov
Attorneys for Petitioner State of Washington

FOR THE CITY OF CHICAGO

MARK A. FLESSNER
Corporation Counsel
BENNA RUTH SOLOMON

Deputy Corporation Counsel
JARED POLICICCHIO
Supervising Assistant Corporation Counsel
30 N. LaSalle Street, S. 800
Chicago, IL 60602
Tel: (312) 744-7764
Benna.Solomon@cityofchicago.org
Jared.Policicchio@cityofchicago.org
Attorneys for Petitioner City of Chicago

FOR THE DISTRICT OF COLUMBIA

KARL A. RACINE
Attorney General
LOREN L. ALIKHAN
Solicitor General
Office of the Attorney General
400 Sixth Street, NW, Ste. 8100
Washington, D.C. 20001
Tel: (202) 727-6287
Loren.Alikhan@dc.gov
Attorneys for Petitioner District of Columbia

FOR THE CITY AND COUNTY OF DENVER

KRISTIN M. BRONSON
City Attorney
EDWARD J. GORMAN
LINDSAY S. CARDER
Assistant City Attorneys
Denver City Attorney's Office
201 W. Colfax Avenue, Dept. 1207
Denver, Colorado 80202
Tel: (720) 913-3275
Edward.Gorman@denvergov.org
Attorneys for Petitioner City and County of Denver

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 60

[EPA–HQ–OAR–2017–0757; FRL–10013–44–OAR]

RIN 2060–AT90

Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This action finalizes amendments to the oil and natural gas new source performance standards (NSPS) promulgated in 2012 and 2016. These amendments remove sources in the transmission and storage segment from the source category, rescind the NSPS (including both the volatile organic compounds (VOC) and methane requirements) applicable to those sources, and separately rescinds the methane-specific requirements of the NSPS applicable to sources in the production and processing segments. Furthermore, the U.S. Environmental Protection Agency (EPA) adopts an interpretation of Clean Air Act (CAA) section 111 under which the EPA, as a predicate to promulgating NSPS for certain air pollutants, must determine that the pertinent pollutant causes or contributes significantly to dangerous air pollution.

DATES: This final rule is effective on September 14, 2020.

ADDRESSES: The EPA established a docket for this action under Docket ID No. EPA–HQ–OAR–2017–0757. All documents in the docket are listed on the *https://www.regulations.gov/* website. Although listed, some information is not publicly available, *e.g.,* Confidential Business Information or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the internet and will be publicly available only in hard copy form. Publicly available docket materials are available electronically through *https://www.regulations.gov/.* Out of an abundance of caution for members of the public and our staff, the EPA Docket Center and Reading Room are closed to the public, with limited exceptions, to reduce the risk of transmitting COVID–19. Our Docket Center staff will continue to provide remote customer service via email, phone, and webform. For further information and updates on EPA Docket Center services, please visit us online at *https://www.epa.gov/dockets.* The EPA continues to carefully and continuously monitor information from the Center for Disease Control, local area health departments, and our Federal partners so that we can respond rapidly as conditions change regarding COVID–19.

FOR FURTHER INFORMATION CONTACT: For questions about this final action, contact Ms. Amy Hambrick, Sector Policies and Programs Division (E143–05), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541–0964; fax number: (919) 541–0516; and email address: *hambrick.amy@epa.gov.*

SUPPLEMENTARY INFORMATION: *Preamble acronyms and abbreviations.* We use multiple acronyms and terms in this preamble. While this list may not be exhaustive, to ease the reading of this preamble and for reference purposes, the EPA defines the following terms and acronyms here:

AEO Annual Energy Outlook
APA Administrative Procedure Act
BSER best system of emission reduction
CAA Clean Air Act
CFR Code of Federal Regulations
CH_4 methane
CO carbon monoxide
CO_2 carbon dioxide
CO_2 Eq. carbon dioxide equivalent
EAV equivalent annualized value
EG Emission Guidelines
EGU Electricity Generating Units
EIA U.S. Energy Information Administration
EPA Environmental Protection Agency
GHG greenhouse gases
GHGI greenhouse gas inventory
GHGRP Greenhouse Gas Reporting Program
HAP hazardous air pollutant(s)
H_2S hydrogen sulfide
ICR Information Collection Request
IR infrared
kt kilotons
MMT million metric tons
NAAQS National Ambient Air Quality Standards
NAICS North American Industry Classification System
NEI National Emissions Inventory
NEMS National Energy Modeling System
NO_X nitrogen oxides
NSPS new source performance standards
NTTAA National Technology Transfer and Advancement Act
OGI optical gas imaging
OMB Office of Management and Budget
PM particulate matter
$PM_{2.5}$ PM with a diameter of 2.5 micrometers or less
PM_{10} PM with a diameter of 10 micrometers or less
PRA Paperwork Reduction Act
PV present value
RFA Regulatory Flexibility Act
RIA Regulatory Impact Analysis
SC-CH_4 social cost of methane
SCF significant contribution finding
scfh standard cubic feet per hour
SIP state implementation plan
SO_2 sulfur dioxide
tpy tons per year
the Court United States Court of Appeals for the District of Columbia Circuit
TSD technical support document
UMRA Unfunded Mandates Reform Act
U.S. United States
VOC volatile organic compounds

Organization of this document. The information presented in this preamble is organized as follows:

I. Executive Summary

A. Purpose and Summary of the Regulatory Action

The EPA is finalizing amendments to its 2012 and 2016 Rules affecting the oil and natural gas industry, titled, respectively, ''Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews; Final Rule'' (''2012 Rule'') [1] and ''Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources; Final Rule'' (''2016 Rule'').[2] Those rules established NSPS for VOC emissions from the oil and natural gas industry, and the 2016 Rule also established NSPS for greenhouse gases (GHG), in the form of limitations on methane, for that industry.[3] The amendments that the EPA is finalizing are intended to continue existing protections from emission sources within the source category that the EPA originally listed for regulation under CAA section 111—termed the Oil and Natural Gas Production Source Category—while removing regulatory duplication.

In response to President Donald J. Trump's March 2017 Executive Order on Promoting Energy Independence and Economic Growth, the EPA has reviewed the 2012 and 2016 Rules with attention to whether they ''unduly burden the development of domestic energy resources beyond the degree necessary to protect the public interest or otherwise comply with the law'' and, thus, should be ''suspend[ed], revise[d], or rescind[ed]''.[4 5] From this review, the EPA has determined that some of the requirements under those rules are inappropriate. For example, some of these requirements affect sources that are not appropriately identified as part of the regulated source category. In addition, some of the requirements under the 2016 Rule are unnecessary insofar as they impose redundant requirements. Accordingly, the EPA is acting to rescind those requirements while maintaining health and environmental protections from appropriately identified emission sources within the regulated source category.[6]

Specifically, the EPA is finalizing what it referred to as the primary proposal in the September 24, 2019, proposed action (''2019 Proposal''). Thus, this final rule contains two main actions. First, the EPA is finalizing a determination that the source category includes only the production and processing segments of the industry and is rescinding the standards applicable to the transmission and storage segment of the industry. This determination is based on the EPA's review of the original source category listing and its 2012 and 2016 Rules' interpretations of, and its 2016 Rule's revision to, the scope of the source category, which, as revised, covered sources in the transmission and storage segment. Having reexamined its prior rulemakings regarding the scope of this source category and the transmission and storage segment, the EPA has determined that the revision in the 2016 Rule of the original source category was not appropriate. Because the EPA is determining that the original source category did not cover the transmission and storage segment, and that this segment constitutes a separate source category from the production and processing segments, the EPA was authorized to list it for regulation under CAA section 111(b) only by making a cause-or-contribute-significantly and endangerment finding as required by the statute, which the EPA never did. Accordingly, in this first action, the EPA is rescinding the standards applicable to sources in the transmission and storage segment of the oil and natural gas industry.

Second, the EPA is separately rescinding the methane requirements of the NSPS applicable to sources in the production and processing segments. The EPA is concluding that those methane requirements are redundant with the existing NSPS for VOC and, thus, establish no additional health protections. The emission source control technologies that apply to the sources achieve reductions in both methane and VOC emissions, and the recordkeeping and other requirements overlap as well. Rescinding the applicability of the 2016 Rule requirements to methane emissions, while leaving the applicability to VOC emissions in place, will not affect the amount of methane emission reductions that those requirements will achieve.

This final rule also concludes that, as a prerequisite for newly regulating any air pollutant that the EPA did not consider when listing or initially regulating the source category, CAA section 111 requires the EPA to make a finding that emissions of that air pollutant from the source category cause or contribute significantly (which we term the significant contribution finding, or SCF) to air pollution which may reasonably be anticipated to endanger public health or welfare (which we sometimes refer to as dangerous air pollution). Further, the final rule determines that the SCF for methane that the EPA made in the alternative in the 2016 Rule was invalid and did not meet this statutory standard, for two reasons: (i) The EPA made that finding on the basis of methane emissions from the production, processing, and transmission and storage segments, instead of just the production and processing segments; and (ii) the EPA failed to support that finding with either established criteria or some type of reasonably explained and intelligible standard or threshold for determining when an air pollutant contributes significantly to dangerous air pollution. The fact that the 2016 Rule's SCF for methane was invalid provides another basis for rescinding the methane requirements for the

[1] 77 FR 49490 (August 16, 2012).

[2] 81 FR 35824 (June 3, 2016).

[3] Docket ID No. EPA–HQ–OAR–2010–0505.

[4] Executive Order 13783, ''Promoting Energy Independence and Economic Growth,'' section 1(c) (March 28, 2017); *see also* section 7(a) (specifically directing the EPA to review the 2016 Rule, ''and any rules and guidance issued pursuant to it, for consistency with the policy set forth in section 1 of this order and, if appropriate, [to], as soon as practicable, suspend, revise, or rescind the guidance, or publish for notice and comment proposed rules suspending, revising, or rescinding those rules'').

[5] 82 FR 16331 (April 4, 2017) (review of 2016 Rule pursuant to Executive Order 13783, signed by the EPA Administrator).

[6] We note that the EPA is addressing certain specific reconsideration issues—fugitive emissions requirements at well sites and compressor stations, well site pneumatic pump standards, and the requirements for certification of closed vent systems by a professional engineer (PE)—in a separate final rule. *See* Docket ID Item No. EPA–HQ–OAR–2010–0505–7730 and 82 FR 25730.

production and processing segments. While the EPA took comment in the 2019 Proposal on what criteria should inform its judgment as to whether a pollutant causes or contributes significantly to dangerous air pollution, the EPA is not taking further action on such criteria in this rulemaking.

B. Costs and Benefits

The EPA has projected the compliance cost reductions, emissions changes, and forgone benefits that may result from the final rule for the years of analysis, 2021 to 2030. The projected cost reductions and forgone benefits are presented in detail in the Regulatory Impact Analysis (RIA) accompanying this final rule. The EPA notes that the projected cost reductions and forgone benefits are directly associated with the rescission of the NSPS applicable to sources in the transmission and storage segment of the source category and not the rescission of methane from the production and processing segments.

A summary of the key results of this final rule is presented in Table 1.[7] Table 1 presents the present value (PV) and equivalent annualized value (EAV), estimated using discount rates of 7 and 3 percent, of the changes in benefits, costs, and net benefits, as well as the change in emissions under the final rule. Here, the EPA refers to the cost reductions as the ''benefits'' of this rule and the forgone benefits as the ''costs'' of this rule in Table 1. The net benefits are the benefits (cost reductions) minus the costs (forgone benefits).

TABLE 1—COST REDUCTIONS, FORGONE BENEFITS, AND FORGONE EMISSIONS REDUCTIONS OF THE FINAL RULE, 2021 THROUGH 2030

[Millions 2016$]

	7-Percent discount rate		3-Percent discount rate	
	PV	EAV	PV	EAV
Benefits (Total Cost Reductions)	$31	$4.1	$38	$4.3
Costs (Forgone Benefits)	17	2.2	63	7.2
Net Benefits [1]	14	1.9	−25	−2.9
Emissions	Forgone Reductions			
Methane (short tons)	400,000			
VOC (short tons)	11,000			
Hazardous Air Pollutant(s) (HAP) (short tons)	330			
Methane (million metric tons carbon dioxide equivalent (CO_2 Eq.))	9			

[1] **Note:** Estimates may not sum due to independent rounding.

This final rule is expected to result in benefits (compliance cost reductions) for affected owners and operators. The PV of these benefits (cost reductions), discounted at a 7-percent rate, is estimated to be about $31 million, with an EAV of about $4.1 million (Table 1). Under a 3-percent discount rate, the PV of cost reductions is $38 million, with an EAV of $4.3 million (Table 1).

The estimated costs (forgone benefits) include the monetized climate effects of the projected increase in methane emissions under the final rule. The PV of these climate-related costs (forgone benefits), discounted at a 7-percent rate, is estimated to be about $17 million, with an EAV of about $2.2 million (Table 1). Under a 3-percent discount rate, the PV of the climate-related costs (forgone benefits) is about $63 million, with an EAV of about $7.2 million (Table 1). The EPA also expects that there will be increases in VOC and HAP emissions as a result of this final rule. While the EPA expects that the forgone VOC emission reductions may also degrade air quality and adversely affect health and welfare effects associated with exposure to ozone, particulate matter with a diameter of 2.5 micrometers or less ($PM_{2.5}$), and HAP, we are unable to quantify these effects at this time. This omission should not imply that these forgone benefits do not exist. To the extent that the EPA were to quantify these ozone and particulate matter (PM) impacts, the Agency would estimate the number and value of avoided premature deaths and illnesses using an approach detailed in the Particulate Matter National Ambient Air Quality Standards (NAAQS) and Ozone NAAQS RIA (U.S. EPA, 2012; U.S. EPA, 2015).

The PV of the net benefits of this rule, discounted at a 7-percent rate, is estimated to be about $14 million, with an EAV of about $1.9 million (Table 1). Under a 3-percent discount rate, the PV of net benefits is about $−25 million, with an EAV of about $−2.9 million (Table 1).

II. General Information

A. Does this action apply to me?

Categories and entities potentially affected by this action include:

TABLE 2—INDUSTRIAL SOURCE CATEGORIES AFFECTED BY THIS ACTION

Category	NAICS code [1]	Examples of regulated entities
Industry	211120	Crude Petroleum Extraction.
	211130	Natural Gas Extraction.
	221210	Natural Gas Distribution.
	486110	Pipeline Distribution of Crude Oil.
	486210	Pipeline Transportation of Natural Gas.
Federal Government		Not affected.

[7] In a separate action, the EPA is finalizing technical reconsideration amendments to 40 CFR part 60, subpart OOOOa (EPA–HQ–OAR–2017–0483; FRL–10013–60–OAR; FR Doc. 2020–18115). These technical amendments where proposed in October 2018. 83 FR 52056. Please reference that final rule for the summary and rationale of those technical changes. Please refer to the RIA for both rules to see the combined impacts.

TABLE 2—INDUSTRIAL SOURCE CATEGORIES AFFECTED BY THIS ACTION—Continued

Category	NAICS code [1]	Examples of regulated entities
State/local/tribal government	....	Not affected.

[1] North American Industry Classification System (NAICS).

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be affected by this action. Other types of entities not listed in the table could also be affected by this action. To determine whether your entity is affected by this action, you should carefully examine the applicability criteria found in the final rule. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the **FOR FURTHER INFORMATION CONTACT** section, your air permitting authority, or your EPA Regional representative listed in 40 CFR 60.4 (General Provisions).

B. How do I obtain a copy of this document, background information, and other related information?

In addition to being available in the docket, an electronic copy of the final action is available on the internet. Following signature by the Administrator, the EPA will post a copy of this final action at *https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-industry.* Following publication in the **Federal Register**, the EPA will post the **Federal Register** version of the final rule and key technical documents at this same website. A redline version of the regulatory language that incorporates the final changes in this action is available in the docket for this action (Docket ID No. EPA–HQ–OAR–2017–0757). Additional background information about this final rule, including industry and emissions information, regulatory history, litigation background, other notable events, related Federal actions, and a comprehensive summary and rationale of the proposed options can be found at 84 FR 50244 (September 24, 2019).

C. Judicial Review

Under section 307(b)(1) of the CAA, judicial review of this final rule is available only by filing a petition for review in the United States Court of Appeals for the District of Columbia Circuit (''the Court'') by November 13, 2020. Moreover, under section 307(b)(2) of the CAA, the requirements established by this final rule may not be challenged separately in any civil or criminal proceedings brought by the EPA to enforce these requirements. Section 307(d)(7)(B) of the CAA further provides that ''[o]nly an objection to a rule or procedure which was raised with reasonable specificity during the period for public comment (including any public hearing) may be raised during judicial review.'' This section also provides a mechanism for the EPA to convene a proceeding for reconsideration, ''[i]f the person raising an objection can demonstrate to the EPA that it was impracticable to raise such objection within [the period for public comment] or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule.'' Any person seeking to make such a demonstration to us should submit a Petition for Reconsideration to the Office of the Administrator, U.S. Environmental Protection Agency, Room 3000, WJC South Building, 1200 Pennsylvania Ave. NW, Washington, DC 20460, with a copy to both the person(s) listed in the preceding **FOR FURTHER INFORMATION CONTACT** section, and the Associate General Counsel for the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave. NW, Washington, DC 20460.

III. Background

The EPA reviewed the relevant background in the 2019 Proposal, including discussing the oil and natural gas industry and its emissions, 84 FR 50247 through 50; the statutory background, *Id.* at 50251; the regulatory history and litigation background regarding performance standards for the oil and natural gas industry, *Id.* at 50251 and 52; other notable events, including the March 28, 2017, Executive Order that led the EPA to initiate this rulemaking, *Id.* at 50252 and 53; and related state and Federal regulatory actions, *Id.* at 50253 and 54. The EPA incorporates that information by reference and will not repeat it here.

Since the 2019 Proposal, the EPA has updated information on the oil and natural gas industry emissions inventories based on the recently released Inventory of United States Greenhouse Gas Emissions and Sinks: 1990–2018 (published April 13, 2020) and the 2017 National Emissions Inventory (NEI) (released February 2020). In Tables 3 to 7 below, the EPA provides the updated estimate of emissions of methane, VOC, and sulfur dioxide (SO_2) from oil and natural gas industry sources.

Methane emissions in the U.S. and from the oil and natural gas industry. Official U.S. estimates of national level GHG emissions and sinks are developed by the EPA for the U.S. GHG Inventory (GHGI) to comply with commitments under the United Nations Framework Convention on Climate Change. The U.S. GHGI, which includes recent trends, is organized by industrial sectors. The oil and natural gas production, natural gas processing, and natural gas transmission and storage sectors emit 25 percent of U.S. anthropogenic methane. Table 3 below presents total U.S. anthropogenic methane emissions for the years 1990, 2008, and 2018.

TABLE 3—U.S. METHANE EMISSIONS BY SECTOR

[Million metric ton carbon dioxide equivalent (MMT CO_2 eq.)]

Sector	1990	2008	2018
Oil and Natural Gas Production, and Natural Gas Processing and Transmission and Storage	185	185	163
Oil and Natural Gas Production, and Natural Gas Processing	128	153	129
Oil and Natural Gas Transmission and Storage	57	32	34
Landfills	180	125	111

TABLE 3—U.S. METHANE EMISSIONS BY SECTOR—Continued

[Million metric ton carbon dioxide equivalent (MMT CO_2 eq.)]

Sector	1990	2008	2018
Enteric Fermentation	164	174	178
Coal Mining	97	76	53
Manure Management	37	54	62
Other Oil and Gas Sources	44	18	13
Wastewater Treatment	15	15	14
Other Methane Sources [8]	57	51	57
Total Methane Emissions	779	698	650

Emissions from the Inventory of United States Greenhouse Gas Emissions and Sinks: 1990–2018 (published April 13, 2020), calculated using global warming potential (GWP) of 25. *Note:* Totals may not sum due to rounding.

Table 4 below presents total methane emissions from natural gas production through transmission and storage and petroleum production, for years 1990, 2008, and 2018, in MMT CO_2 Eq. (or million metric tonnes CO_2 Eq.) of methane.

TABLE 4—U.S. METHANE EMISSIONS FROM NATURAL GAS AND PETROLEUM SYSTEMS

[MMT CO_2 eq.]

Sector	1990	2008	2018
Oil and Natural Gas Production and Natural Gas Processing and Transmission (Total)	185	185	163
Natural Gas Production	61	100	82
Natural Gas Processing	21	11	12
Natural Gas Transmission and Storage	57	32	34
Petroleum Production	45	42	35

Emissions from the Inventory of United States Greenhouse Gas Emissions and Sinks: 1990–2018 (published April 13, 2020), calculated using GWP of 25. *Note:* Totals may not sum due to rounding.

VOC and SO_2 emissions in the U.S. and from the oil and natural gas industry. Official U.S. estimates of national level VOC and SO_2 emissions are developed by the EPA for the NEI, for which states are required to submit information under 40 CFR part 51, subpart A. Data in the NEI may be organized by various data points, including sector, NAICS code, and Source Classification Code. The oil and natural gas sources emit 5.8 and 2.4 percent of U.S. VOC and SO_2, respectively. Tables 5 and 6 below present total U.S. VOC and SO_2 emissions by sector, respectively, for the year 2017, in kilotons (kt) (or thousand metric tons).

TABLE 5—U.S. VOC EMISSIONS BY SECTOR

[kt]

Sector	2017
Biogenics—Vegetation and Soil	25,823
Fires—Wildfires	4,578
Oil and Natural Gas Production, and Natural Gas Processing and Transmission	2,504
Fires—Prescribed Fires	2,042
Solvent—Consumer and Commercial Solvent Use	1,610
Mobile—On-Road non-Diesel Light Duty Vehicles	1,507
Mobile—Non-Road Equipment—Gasoline	1,009
Other VOC Sources [9]	4,045
Total VOC Emissions	43,118

Emissions from the 2017 NEI (released April 2020). *Note:* Totals may not sum due to rounding.

TABLE 6—U.S. SO_2 EMISSIONS BY SECTOR

[kt]

Sector	2017
Fuel Combustion—Electric Generation—Coal	1,319
Fuel Combustion—Industrial Boilers, Internal Combustion Engines—Coal	212
Mobile—Commercial Marine Vessels	183

[8] Other sources include rice cultivation, forest land, stationary combustion, abandoned oil and natural gas wells, abandoned coal mines, mobile combustion, composting, and several sources emitting less than 1 MMT CO_2 Eq. in 2018.

TABLE 6—U.S. SO_2 EMISSIONS BY SECTOR—Continued

[kt]

Sector	2017
Industrial Processes—Not Elsewhere Classified	138
Fires—Wildfires	135
Industrial Processes—Chemical Manufacturing	123
Oil and Natural Gas Production and Natural Gas Processing and Transmission	65
Other SO_2 Sources [10]	551
Total SO_2 Emissions	2,726

Emissions from the 2017 NEI (released April 2020). *Note:* Totals may not sum due to rounding.

Table 7 below presents total VOC and SO_2 emissions from oil and natural gas production through transmission and storage, for the year 2017, in kt (or thousand metric tons).

TABLE 7—U.S. VOC AND SO_2 EMISSIONS FROM NATURAL GAS AND PETROLEUM SYSTEMS

[kt]

Sector	VOC	SO_2
Oil and Natural Gas Production and Natural Gas Processing and Transmission (Total)	2,504	65
Oil and Natural Gas Production	2,478	41
Natural Gas Processing	12	23
Natural Gas Transmission and Storage	14	1

Emissions from the 2017 NEI, (published April 2020), in kt (or thousand metric tons). *Note:* Totals may not sum due to rounding.

IV. 2019 Proposal

On September 24, 2019, the EPA issued a proposed rulemaking (2019 Proposal) to amend the 2012 Rule and 2016 Rule for the oil and natural gas industry that would remove regulatory duplication and save the industry millions of dollars in compliance costs each year, while maintaining health and environmental protections from oil and natural gas sources that the Agency considers appropriate to regulate in this rule.[11] The EPA issued the proposal in response to President Trump's Executive Order on Promoting Energy Independence and Economic Growth. Generally speaking, that order directs agencies to review existing regulations that potentially ''burden the development or use of domestically produced energy resources,'' including oil and natural gas, and to suspend, revise, or rescind such regulatory requirements if appropriate. The proposal included a primary regulatory option and an alternative regulatory option. The primary option proposed to remove all sources in the transmission and storage segment of the oil and natural gas industry from regulation under the NSPS, both for VOC and for GHG. The primary option separately proposed to rescind the methane requirements in the 2016 Rule that apply to sources in the production and processing segments of the industry. The alternative option proposed to rescind the methane requirements that apply to all sources in the oil and natural gas industry, without removing any sources from the source category as defined in the 2016 Rule. The EPA additionally solicited comment on alternative interpretations of the EPA's legal authority to regulate pollutants under CAA section 111.

CAA section 111 requires the EPA to set NSPS for categories of stationary sources that the EPA has listed (''source categories'') because they cause, or significantly contribute to, air pollution that may reasonably be anticipated to endanger public health or welfare. The Agency's original source category listing for the oil and natural gas industry, issued in 1979, included only the crude oil and natural gas production and natural gas processing segments of the industry. However, in the 2012 Rule and 2016 Rule, the EPA interpreted the 1979 listing to have established the scope of the source category as including the industry's transmission and storage segment. In the 2016 Rule, the EPA also, as an alternative, expanded the source category to include the transmission and storage segment. In the 2019 Proposal, the EPA proposed to remove sources in the transmission and storage segment from the Oil and Natural Gas Production source category on the grounds that the Agency had erred in the 2012 and 2016 Rules when it had interpreted or expanded the source category, because the transmission and storage segment of the industry is functionally separate from the production and processing segment. The EPA further stated that a separate SCF would be necessary for that segment to be listed as a source category for regulation. The proposal further stated that the emissions limits that apply to sources in the transmission and storage segment in the 2012 Rule and 2016 Rule would be rescinded because that segment would be removed from the source category. Finally, the EPA proposed to rescind emissions requirements for methane for sources located in the production and processing segments on grounds that those requirements are redundant to the requirements for VOC. The proposal made clear that the emissions limits for VOC would remain for the production and processing segments.

In the alternative proposal, the EPA proposed to rescind the methane requirements in the 2016 Rule for all oil and natural gas sources, without removing the transmission and storage sources from the source category. Under this alternative, the rule would retain VOC standards for the production, processing, and transmission and storage segments of the industry. As with the primary proposal, the alternative proposal is based on the view that because the controls to reduce VOC emissions also reduce methane, separate methane requirements for the industry are redundant.

The EPA further stated that the proposed amendments would remove the Agency's obligation to develop emission guidelines (EG) to address methane emissions from existing sources under section 111(d) of the CAA. The EPA stated its belief that not

[9] Other sources include remaining sources emitting less than 1,000 kt VOC in 2017.

[10] Other sources include remaining sources emitting less than 100 kt SO_2 in 2017.

[11] 84 FR 50244.

regulating existing sources would have limited environmental impact, because some existing sources will ''modify'' such that they will become subject to requirements for new sources, and because the number of remaining sources may decline over time as they are shut down or become obsolete.

The EPA also took comment on an alternative interpretation of its legal authority to regulate pollutants under CAA section 111. In the 2016 Rule, the EPA took the position that the law did not require the Agency, as a prerequisite to regulating methane as part of the NSPS, to first make a separate determination that GHG emissions from the oil and natural gas industry cause, or significantly contribute to, dangerous air pollution (a pollutant-specific SCF). However, the Agency also made a finding in the alternative that if the CAA were interpreted to require a pollutant-specific SCF, then GHG emissions from the Oil and Natural Gas source category do cause or contribute significantly to dangerous air pollution. The 2019 Proposal solicited comment on three issues: (1) Whether the Agency should revise the interpretation it took in the 2016 Rule, so that CAA section 111 requires the EPA to make a pollutant-specific SCF for GHG emissions from the oil and natural gas industry as a predicate to regulation; (2) whether, if CAA section 111 does require a pollutant-specific SCF, whether the finding in the alternative in the 2016 Rule satisfied that requirement; and (3) what, if any, specific criteria the EPA should use to make a pollutant-specific SCF.

The EPA solicited comments on all aspects of the proposal during a 60-day public comment period. The EPA held a public hearing in Dallas, Texas, in October 2019; 105 speakers provided oral testimony and 32 observers attended. The EPA received almost 300,000 public comments on the proposed rule. The EPA is not responding to any late comment received.

V. Final Action and Rationale

A. Summary of Final Action

The EPA is finalizing what was referred to as the primary proposal in the 2019 Proposal. First, the final rule removes all sources in the transmission and storage segment of the oil and natural gas industry from regulation under the NSPS and removes all emissions limitations for both VOC and GHG for sources in the transmission and storage segment. Second, the final rule separately rescinds the standards for methane emissions in the 2016 Rule that apply to sources in the production and processing segments of the industry. Third, the final rule articulates the EPA's interpretation that under CAA section 111(b)(1)(A), as a prerequisite for newly regulating any air pollutant, the Agency is required to make a finding that emissions of the air pollutant, from the source category, cause or contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. Further, the final rule concludes that the alternative SCF made by the EPA in the 2016 Rule was invalid and did not meet this statutory standard.

B. Rationale

1. Revision of the Source Category To Remove Transmission and Storage Segment

As noted above, the EPA is finalizing its proposal to remove the transmission and storage segment entirely from the source category and rescind the NSPS requirements applicable to sources within that segment. This final action is based on the EPA's determination that its 2012 and 2016 rulemakings that interpreted or expanded the source category to include sources in that segment were improper. The following discussion provides background on CAA section 111, the history of the Oil and Natural Gas Production source category, and the rationale for this final decision.

Under CAA section 111(b)(1)(A), the EPA must ''publish . . . a list of categories of stationary sources, emissions from which, in the judgment of the Administrator, cause[ ], or contribute[ ] significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare.'' Further, CAA section 111(b)(1)(A) directs that ''from time to time thereafter'' the EPA ''shall revise'' this ''list'' of categories of stationary sources. Following the ''inclusion of a category of stationary sources in a list,'' the EPA then proposes and promulgates ''standards of performance for new sources within such category.'' CAA Section 111(b)(1)(B). Thereafter, the EPA ''shall . . . review and, if appropriate, revise such standards.'' *Id.*

CAA section 111(b)(1)(A) does not include any specific criteria for determining the reasonable scope of a given ''category'' of ''stationary sources'' beyond the requirement that the Administrator make a finding that, in his or her ''judgment,'' emissions from the ''category of sources . . . cause[ ], or contribute[ ]significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare.'' Accordingly, the EPA is afforded some measure of discretion in determining at the outset the scope of a source category.

In 1978, the EPA published ''Priorities for New Source Performance Standards Under the Clean Air Act Amendments of 1977.''[12] The purpose of this document was to implement the requirements of CAA section 111(f) to develop and apply a methodology for identifying, establishing, and prioritizing the source categories that should be considered first for in-depth analysis prior to NSPS promulgation under CAA section 111. For purposes of the 1978 analysis, the EPA aggregated emissions from ''oil and gas production fields'' and ''natural gas processing'' as part of the ''Crude Oil and Natural Gas Production Plant'' source category. The EPA identified this aggregated source category as a major source of hydrocarbon (HC) and SO_2 emissions. When the EPA finalized the priority list in 1979, it revised the name of the source category as ''Crude Oil and Natural Gas Production.'' 49 FR 49222 (August 21, 1979).

In 1985, the EPA promulgated two rulemakings establishing NSPS for the Crude Oil and Natural Gas Production source category. These were 40 CFR part 60, subpart KKK—Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants (50 FR 26124, June 23, 1985); and subpart LLL—Standards of Performance for SO_2 Emissions from Onshore Natural Gas Processing (50 FR 40160, October 1, 1985). When it first proposed 40 CFR part 60, subpart KKK, the EPA noted that the ''crude oil and natural gas production industry encompasses the operations of exploring for crude oil and natural gas products, removing them from beneath the earth's surface, and processing these products for distribution to petroleum refineries and gas pipelines.''[13] The EPA repeated that description of the identified source category when it proposed 40 CFR part 60, subpart LLL, explaining that the ''crude oil and natural gas production industry encompasses not only processing of the natural gas (associated or not associated with crude oil) but operations of exploration, drilling, and subsequent removal of the gas from porous geologic formations beneath the earth's surface.''[14]

In 2012, the EPA reviewed the VOC and SO_2 standards and at the same time

[12] Priorities for New Source Performance Standards Under the Clean Air Act Amendments of 1977. April 1978. EPA–450/3–78–019.

[13] 49 FR 2637 (January 20, 1984).

[14] 49 FR 2658 (January 20, 1984).

established new requirements for additional stationary sources of VOC emissions that had not been regulated in the 1985 rulemaking (*e.g.,* well completions, pneumatic controllers, storage vessels, and compressors)—''Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews—Final Rule'' (77 FR 49490, August 16, 2012). In the preamble of the 2011 proposal for the 2012 Rule, the EPA interpreted the 1979 listing as indicating that ''the currently listed Oil and Natural Gas source category covers all operations in this industry (*i.e.,* production, processing, transmission, storage and distribution).'' ''Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews—Proposed Rule,'' 76 FR 52738, 52745 (August 23, 2011). Further, the EPA stated that ''[t]o the extent there are oil and gas operations not covered by the currently listed Oil and Natural Gas source category. . . ., we hereby modify the category list to include all operations in the oil and natural gas sector.'' *Id.* The stated basis for that proposed decision was that ''[s]ection 111(b) of the CAA gives the EPA the broad authority and discretion to list and establish NSPS for a category that, in the Administrator's judgment, causes or contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare.'' *Id.* No additional discussion of this listing position was provided in the 2011 proposal.

In the 2012 final rulemaking, the EPA promulgated NSPS for emission sources in the production, processing, and transmission and storage segments, 77 FR 49492, and stated that ''[t]he listed Crude Oil and Natural Gas Production source category covers, at a minimum, those operations for which we are establishing standards in this final rule.'' *Id.* at 49496. In responding to comments, the EPA took the position that it was not actually revising the source category to include emission sources in the transmission and storage segment, but rather, was interpreting the 1979 listing to be ''broad,'' and interpreting the 1985 rulemaking as ''view[ing] this source category listing very broadly,'' *Id.* at 49514, so that, in the EPA's view, the source category was already sufficiently broad to include that segment.[15]

In 2016, the EPA promulgated additional NSPS (40 CFR part 60, subpart OOOOa) for the Crude Oil and Natural Gas Production source category (81 FR 35824, June 3, 2016). As the EPA did in the 2012 Rule, the EPA took the position that the 1979 listing was broad enough to encompass the transmission and storage segment and that the 1985 rulemakings confirmed that broad listing. 81 FR 35832 (''The scope of the 1978 Priority List is further demonstrated by the Agency's pronouncements during the NSPS rulemaking that followed the listing.''). The EPA stated that the inclusion of the transmission and storage segment into the original 1979 source category was warranted because equipment and operations at production, processing, transmission and storage facilities are a sequence of functions that are interrelated and necessary for getting the recovered gas ready for distribution. Nevertheless, the EPA recognized that the scope of the prior listing may have had some ambiguity. Accordingly, ''as an alternative,'' the EPA finalized a revision of the category to broaden it, so that ''[a]s revised, the listed oil and natural gas source category includes oil and natural gas production, processing, transmission, and storage'' and the EPA changed the source category name to be ''Crude Oil and Natural Gas source category.'' (81 FR 35840).

a. Scope of 1979 Listing Action

For this final rule, the EPA has reviewed the original 1979 listing of the Crude Oil and Natural Gas Production source category and the associated background materials and now finds that its 2012 and 2016 interpretation of the 1979 listing (*i.e.,* that the 1979 listing included natural gas transmission and storage) was erroneous. *See F.C.C.* v. *Fox Television Stations, Inc.,* 556 U.S. 502 (2009) (an agency may revise its policy, but must demonstrate that the new policy is permissible under the statute and is supported by good reasons, taking into account the record of the previous rule). The EPA received comments on the 2019 Proposal concerning this issue and the associated rationale. These comments are provided, along with the EPA's responses, in section VIII.A of this preamble and in Chapter 5 of the Response to Comments Document for this action. None of the comments received resulted in a change in the EPA's rationale and conclusions from proposal. The following explains our decision.[16]

While the EPA has listed source categories that are broad,[17] the silence of the 1979 listing as to the transmission and storage segment suggests that the segment was *not* considered for inclusion at the time of the listing. Principles of administrative law require that in order for something (in this case, the transmission and storage segment) to be subject to regulation, the EPA should provide for and explain such regulation clearly. Moreover, where the EPA has remained silent on any explanation for its choice of regulation, the Court has held, ''a rule without a stated reason is necessarily arbitrary and capricious.'' *Small Refiner Lead Phase-Down Task Force* v. *U.S. EPA,* 705 F.2d 506, 551 (1983). Accordingly, if the EPA had intended for the 1979 listing to include the transmission and storage segment, the Agency's failure to explain that decision would have rendered it arbitrary and capricious. It is reasonable to presume that the Agency did not act arbitrarily and capriciously, and, therefore, that its silence regarding the transmission and storage segment indicated that it did not intend to cover that segment in the 1979 listing.

Additionally, to the extent there was ambiguity in the original 1979 listing, the EPA made clear its interpretation in 1984, when the EPA proposed to set the first standards of performance for sources within the Crude Oil and Natural Gas Production source category (*i.e.,* 40 CFR part 60, subpart KKK). The views the Agency expressed concerning the scope of the source category are particularly relevant because this rulemaking was conducted shortly after the listing and because it established the initial NSPS. In this proposal, the EPA described the category as ''encompass[ing] the operations of exploring for crude oil and natural gas products, removing them from beneath the earth's surface and processing these products for distribution to petroleum refineries and gas pipelines,'' but this description made no reference to the subsequent activities of transmission

[15] In the 2012 Rule rulemaking, the EPA referred to the distribution segment of the oil and natural gas industry, which entails transporting natural gas to the end user. 76 FR 52738, 52745 (August 23, 2011) (proposed rule); 77 FR 49514, 77 FR 49493 (Table 2) (August 16, 2012) (final rule). However, in the 2016 Rule, the EPA clarified that the scope of the Oil and Natural Gas Production and Processing source category includes the transmission and storage segment, but not the distribution segment. In addition, the EPA has never treated any sources in the distribution segment as subject to the requirements of NSPS subpart OOOO or OOOOa.

[16] In 1979, the EPA named the source category ''Crude Oil and Natural Gas Production source category.'' In 2016, the EPA changed the source category name to be ''Crude Oil and Natural Gas source category.'' Because this final rule rescinds the 2016 expansion, the EPA is finalizing the source category's name back to how it read in 1979.

[17] The EPA also has listed narrow source categories, as noted in section VIII.A of this preamble.

and storage of crude oil and natural gas products.[18] This description is reasonably read to establish that sources in the transmission and storage segment were not included in the Crude Oil and Natural Gas Production source category as listed in 1979.

Similarly, in the same sentence, the EPA defined the scope of the source category as encompassing oil operations up to the point of distribution to petroleum refineries, which are a separate source category. In this manner, the EPA indicated that the Crude Oil and Natural Gas Production source category includes operations from well sites (exploration, drilling, and removal) and natural gas processing plants (processing). While gathering and boosting compressor stations were not specified, it is reasonable to conclude that they are also included because they are located between two covered sites, the well site and the processing plant. However, to reiterate, subsequent operations, such as transmission and storage, and distribution were not included.

In the 1984 proposal, the EPA added that ''there are several VOC emission points within this industry,'' which the Agency categorized as process, storage, and equipment leaks. 49 FR 2637. In the 2016 NSPS, the EPA used this description of the three sets of emission points as support for the proposition that the Agency previously intended the source category to include transmission and storage. Specifically, the EPA stated that ''these emissions can be found throughout the various segments of the natural gas industry.'' 81 FR 35832. The EPA has closely reexamined the language of the 1984 proposal and found that, importantly, in the descriptions of these three categories of emission points, it is clear that the EPA considered these emission sources only in the production and processing segments. Therefore, while it is true that there are process, storage, and equipment leak emissions throughout the oil and natural gas sector, the discussion in the 1984 proposal entirely focused on these sources in the production and processing segments, and made no reference to the transmission and storage segment. The following discusses each of those three sets of sources in more detail.

With respect to process sources, the 1984 proposal states that they include well systems, field oil and natural gas separators, wash tanks, settling tanks, and other sources. The proposal further states that process sources remove the crude oil and natural gas from beneath the earth and separate gas and water from the crude oil. 49 FR 2637. This description of the process emission point clearly refers to the production and processing segments and is silent concerning the transmission and storage segment.

For the second set of emission points, storage sources, the 1984 proposal states that they include field storage tanks, condensate tanks, and cleaned oil tanks. These tanks emit VOC, the pollutant addressed in the 1984 proposal. These three types of tanks are common in the production segment and/or at natural gas processing plants; as gas is separated from oil, condensate and impurities, these tanks are used to store oil and condensate, which contain VOC. As such, these tanks are storage sources of VOC emissions. In contrast, storage at natural gas transmission and storage facilities refers to storage of gas, mostly in the underground storage reservoirs. Because the gas stored in underground reservoirs is pipeline quality natural gas (95–98 percent methane), these storage facilities in the transmission and storage segment are not emission points of concern for VOC, or any of the other pollutants identified in the 1984 proposal as being emitted from the oil and gas industry. Additionally, the cited discussion in the proposal made no explicit mention of transmission and storage facilities. Furthermore, there are no oil tanks or field tanks in the transmission and storage segment. As for condensate tanks, these tanks are rarely used at the transmission and storage segment because, as mentioned above, the gas that enters this segment is pipeline quality gas and, therefore, contains little to no condensate. Given the reference in the 1984 proposal to two other types of tanks that are also commonly found in the production and processing segments but absent in the transmission and storage segment, it is reasonable to conclude that the proposal's reference to condensate tanks was also intended to be limited to the production and processing segments. For all of these reasons, the better reading of the 1984 proposal discussion on storage tanks is that it was limited only to such tanks located in the production and processing segments, and was not intended to encompass tanks located in the transmission and storage segment.

Similarly, the 1984 proposal describes the equipment leak emission points as referring to the production and processing segments of the Oil and Natural Gas source category and is silent concerning the transmission and storage segment. The proposal explains that equipment leaks of VOC can occur from ''pumps, valves, compressors, open ended lines or valves, and pressure relief devices used in onshore crude oil and natural gas *production* (emphasis added).'' *Id.* Additionally, the preamble acknowledges that there is equipment used in crude oil and natural gas production and distinguishes this from equipment used in natural gas processing. The EPA examined the use of leak detection and repair work practices for equipment leaks of VOC at natural gas processing plants and explained in the preamble that the costs and emission reduction numbers for the application of these techniques at the ''widely dispersed'' crude oil and natural gas production sites were not known at that time. In this manner, the EPA clearly acknowledged the existence of equipment leaks at both the production and processing segments. In contrast, although equipment leaks do occur in the transmission and storage segment, the proposal makes no mention of leaks in that segment. Thus, each of the three sets of emission sources under consideration in the 1984 proposal clearly is in the production and processing segments, and the proposal is silent about the transmission and storage segment.

Another indicator that the 1984 proposal did not consider transmission and storage lies in the fact that this proposal addressed VOC emissions. As discussed below, the composition of the natural gas in the transmission and storage segment is significantly different than in the production and processing segments, as the transmission and storage segment contains considerably less VOC, and as a result, sources in that segment emit low amounts of VOC. In many areas of the country, particularly those that produce liquids and associated gas, the production and processing segments have high VOC-content gases, but the transmission and storage operations have substantially lower VOC-content gases. In light of the fact that the 1979 listing concerned VOC content (termed, at that time, HC), this difference between the segments further supports the view that the EPA would not have included transmission and storage in the 1979 listing. This corroborates that the proposal did not consider emission sources related to the transmission and storage of natural gas. Thus, although process, storage, and equipment leaks are emission sources that are present across the industry, including in natural gas transmission and storage, additional examination of the 1984 proposal makes it clear that it considered process, storage, and equipment leaks in only the production

[18] 49 FR 2637; *see* also 49 FR 2658.

and processing segments of the oil and natural gas industry.

For the reasons noted above, the EPA concludes that its statements in the 2012 and 2016 Rules that the 1979 listing of the Crude Oil and Natural Gas Production source category included the transmission and storage segment, and that the 1984 proposal confirmed that action, were in error. Rather, the record of the 1979 action indicates that the source category did not include that segment, and the Agency confirmed that narrower scope of the source category in its 1984 proposal to promulgate the initial set of NSPS.

b. Operations in the Transmission and Storage Segment Are Distinctly Different

As noted above, the 2016 Rule stated that the ''1979 listing of [the Crude Oil and Natural Gas Production] source category provides sufficient authority for this action'' to promulgate NSPS for sources in the transmission and storage segment, but then added that, ''to the extent that there is ambiguity in the prior listing, the EPA hereby . . ., as an alternative, . . . revis[es] . . . the category listing to broadly include the oil and natural gas industry.'' [19] ''As revised,'' the 2016 Rule continued, ''the listed oil and natural gas category includes oil and natural gas production, processing, transmission, and storage.'' [20] As discussed in the following paragraphs, the EPA is concluding, in line with the 2019 Proposal, that this alternative approach of revising the scope of the source category to include sources within the transmission and storage segment was also in error and should be rejected.

The EPA received comments on this issue, including the associated rationale. These comments are provided, along with the EPA's responses, in section VIII.A of this preamble and in Chapter 5 of the Response to Comments Document for this action. None of the comments received resulted in a change in the EPA's rationale and conclusions from proposal.

While CAA section 111(b)(1)(A) and (B) respectively authorize the EPA to ''revise,'' where warranted, both the ''list of source categories'' and ''standards of performance'' that the EPA has promulgated, nothing in CAA section 111 expressly authorizes or directs the EPA to ''revise'' a particular ''source category'' by altering its scope once the EPA has listed that source category. However, the EPA has inherent authority to reconsider, repeal, or revise past decisions, to the extent permitted by law, so long as the Agency provides a reasoned explanation. *See Sang Seup Shin* v. *INS,* 750 F.2d 122, 130 (D.C. Cir. 1984) (in absence of specific statutory prohibition, an agency has inherent authority to reconsider its decisions). The CAA complements the EPA's inherent authority to reconsider prior rulemakings by providing the Agency with broad authority to prescribe regulations as necessary, under CAA section 301(a). Even so, the authority to revise the scope of a source category must be exercised within reasonable boundaries and cannot be employed in a way that results in an unreasonable expansion of an existing source category. For the reasons discussed below, the EPA is not authorized to expand the scope of a listed source category to cover a new set of sources that are not sufficiently related to the sources in the pre-existing category, so that they constitute a separate source category for which the EPA would be required to make a new SCF and endangerment finding under CAA section 111(b)(1)(A) as a prerequisite to regulating them. Otherwise, expanding the source category by including new sources could be used to circumvent that requirement.

The EPA proposed to determine that the operations in the transmission and storage segment are not sufficiently related to the production and processing segments that were included in the original source category listing. In the 2016 Rule, the EPA held that the source category should be expanded because equipment and operations at production, processing, and transmission and storage facilities are a sequence of functions that are interrelated and necessary for getting the gas ready for distribution. In the 2019 Proposal, the EPA proposed to determine that this 2016 finding was unreasonable and proposed that transmission and storage operations are distinct from production and processing operations because (among other things) the natural gas that enters the transmission and storage segment has different composition and characteristics than the natural gas that enters the production and processing segments. 84 FR 50257.

While CAA section 111 does not define the term ''source category'' or use the phrase ''sufficiently related,'' this concept is inherent in the everyday definition of ''category.'' Merriam-Webster defines ''category'' as ''any of several fundamental and distinct classes to which entities or concepts belong,'' [21] and it defines a ''class[ ]'' as ''a group, set, or kind sharing *common* attributes'' (emphasis added).[22] Commenters point out what they view as commonalities among both the production and processing and transmission and storage segments. These comments implicitly acknowledge that, to be a ''category,'' the associated sources must have something in common, that is, they must be sufficiently related to merit being associated as part of the same category. The EPA may not have articulated the ''sufficiently related'' test in those terms in prior actions, but, again, that test is implicit in the everyday meaning of ''category.'' That is, for items to be part of a ''category'' they must have key things in common, and if they have substantial differences, they should not be included in the same category. Without this test, it would be difficult to develop a basis for ascertaining the scope of a category. For this reason, the EPA has in effect regularly applied this test. For example, fugitive VOC emissions from leaking equipment occurs across several industries, including the synthetic organic chemical manufacturing industry and the petroleum refinery industry, but there are substantial enough differences between those industries to warrant putting them in separate source categories, notwithstanding the fact that some of their equipment is similar. For another example, when proposing to expand the original Asphalt Roofing Plants source category listing to include other locations where the preparation of asphalt for roofing may take place, such as oil refineries, the EPA stated that, ''the emissions, processes, and applicable controls for blowing stills and asphalt storage tanks at oil refineries and asphalt processing plants are the same as those at asphalt roofing plants. It is therefore reasonable to treat the asphalt processing and roofing manufacture industry as a single category of sources for the purposes of establishing standards of performance.'' 45 FR 76428. By finding commonality in emissions, processes, and applicable controls for these otherwise different sources, the EPA determined that they should be part of the same source category.

[19] 81 FR 35833.

[20] *Id.* (footnote omitted).

[21] ''Category.'' *Merriam-Webster.com Dictionary,* Merriam-Webster, *https://www.merriam-webster.com/dictionary/category.* Accessed 21 May, 2020.

[22] ''Class.'' *Merriam-Webster.com Dictionary,* Merriam-Webster, *https://www.merriam-webster.com/dictionary/class.* Accessed 19 May, 2020.

In contrast, based on a reexamination of the processes and operations found in the transmission and storage segment, the EPA is finalizing its determination that transmission and storage sources are, in fact, sufficiently distinct from production and processing sources so that the Agency erred when, in the 2016 Rule, it revised the source category to include sources in the transmission and storage segment. Specifically, the EPA now concludes that the processes and operations found in the transmission and storage segment are distinct from those found in the production and processing segments because the purposes of the operations are different and because the natural gas that enters the transmission and storage segment has different composition and characteristics than the natural gas that enters the production and processing segments.

The primary operations of the production and processing segments are exploring crude oil and natural gas products beneath the earth's surface, drilling wells to extract these products, and processing the crude oil and field gas for distribution to petroleum refineries and natural gas pipelines. As stated previously in this section, the EPA described this source category's operations similarly when proposing 40 CFR part 60, subpart KKK, in 1984. 49 FR 2637. The primary purpose of these segments is to obtain the product and then, in the case of natural gas, to remove impurities from the extracted product. At a well site (production segment), crude oil and natural gas are extracted from the ground. Some processing can take place at the well site, such as the physical separation of gas, production fluids, and condensate. Of these products, crude oil and natural gas undergo successive, separate processing. Crude oil is separated from water and other impurities and transported to a refinery via truck, railcar, or pipeline. The EPA treats oil refineries as a separate source category, accordingly, for present purposes, the oil component of the production segment ends at the point of custody transfer at the refinery.[23] The separated gas (''field gas'') is then sent through gathering pipelines to the natural gas processing plant (processing segment).[24] At the processing plant, the field gas is converted to sales gas or pipeline quality gas. This involves several steps, including the extraction of natural gas liquids (*e.g.,* a mixture of propane, butane, pentane) from the field gas, the fractionation of these natural gas liquids into individual products (*e.g.,* liquid propane), or both extraction and fractionation. The final natural gas that exits in the processing plant is sales gas, which is predominantly methane. In these segments, the field gas has physically changed such that it is a usable product.

The operations of the production and processing segments differ from the transmission and storage segment operations because in the latter, the natural gas does not undergo changes in composition, except for some limited removal of liquids that condensed during the temperature and pressure changes as the natural gas moves through the pipeline. Therefore, the natural gas that enters the transmission and storage segment has approximately the same composition and characteristics as the natural gas that leaves the segment for distribution. The segment includes natural gas transmission compressor stations, whose primary operation is to move the natural gas through transmission pipelines by increasing the pressure. Dehydration, which can also occur at compressor stations, is a secondary operation used when the natural gas has collected water during transmission. As discussed in the 2019 Proposal, this differs from the significant natural gas processing in the production and processing segments, which involves a series of processing steps dependent on factors such as the type of natural gas (*e.g.,* wet or dry gas), market conditions, and company contract specifications. 84 FR 50258. At storage facilities, natural gas is injected into underground storage for use during peak seasons.[25] When demand increases, the natural gas is extracted from the underground storage, dehydrated to remove water that has entered during storage, compressed, and moved through distribution pipelines.

Analysis of the composition of natural gas on a nationwide basis in the various industry segments confirms the different character of the segments. In 2011 and subsequently in 2018, the EPA conducted an analysis of the composition, expressed in percent volume, of natural gas based on the methane, VOC, and HAP content across the various industry segments.[26] [27] For example, in 2011, the nationwide composition for the production segment, which included wells and unprocessed natural gas, consisted of approximately 83-percent methane, 4-percent VOC, and less than 1-percent HAP. In contrast, the transmission segment, which included pipeline and sales gas (*i.e.,* post processing), consisted of approximately 93-percent methane, 1-percent VOC, and less than 0.01-percent HAP. In 2018, the EPA reviewed new studies available and found similar results for the production segment. The nationwide composition for the production segment consisted of approximately 88-percent methane and 4-percent VOC. At proposal in 2019, we concluded that these differences in the gas composition demonstrated that the emissions profile is different following gas processing. After proposal in 2019, the EPA conducted a comprehensive analysis of data reported directly to the Greenhouse Gas Reporting Program (GHGRP) for reporting years 2015 through 2018 to determine whether the composition of natural gas, in terms of methane content, is statistically different between industry segments.[28] In order to determine whether the methane content is statistically different between industry segments, the analysis evaluated the average methane concentration for each segment based on the 2015–2018 GHGRP reporting data.[29]

[23] *See* 40 CFR part 60, subparts J and Ja, and 40 CFR part 63, subparts CC and UUU.

[24] Natural gas with high methane content is referred to as ''dry gas,'' while natural gas with significant amounts of ethane, propane, or butane is referred to as ''wet gas.'' The degree and location of processing is dependent on various factors, one being the type of natural gas (*e.g.,* wet or dry gas). In some ''dry gas'' areas, the field gas, with naturally higher methane content, may go from the well site directly into the transmission and storage segment without processing in a gas processing plant. The fact that some produced natural gas does not require processing and can be transported directly into the transmission and storage segment does not diminish the differences between the production and processing segments, on the one hand, and the transmission and storage segment, on the other. Rather, it just means that some gas does not need to go through the processing segment.

[25] Storage can also take place in above ground storage vessels; however, it is the EPA's understanding that these are more commonly used after the local distribution company custody transfer (LDC) or commonly ''city gate,'' which has not been included in the source category at any point. The term ''local distribution company custody transfer,'' defined in 40 CFR part 60, subpart OOOOa, means a metering station where the LDC receives a natural gas supply from an upstream supplier, which may be an interstate transmission pipeline or a local natural gas producer, for delivery to customers through the LDC's intrastate transmission or distribution lines. This final rule adds the definition of LDC to 40 CFR part 60, subpart OOOO.

[26] Memorandum to Bruce Moore, U.S. EPA from Heather Brown, EC/R. ''Composition of Natural Gas for use in the Oil and Natural Gas Sector Rulemaking.'' July 2011. Docket ID Item No. EPA–HQ–OAR–2010–0505–0084.

[27] Memorandum to U.S. EPA from Eastern Research Group. ''Natural Gas Composition.'' November 13, 2018. Docket ID No. EPA–HQ–OAR–2017–0757.

[28] Memorandum. Analysis of Average Methane Concentrations in the Oil and Gas Industry Using Data Reported Under 40 CFR part 98 Subpart W. April 9, 2020. Included in Docket ID No. EPA–HQ–OAR–2017–0757.

[29] See Table 17 of Memorandum. Analysis of Average Methane Concentrations in the Oil and Gas

For oil and natural gas production, the analysis estimated an average methane content of 69 and 83 percent, respectively. For gathering and boosting,[30] the analysis estimated an average methane content of 81 percent, and for gas processing, an average methane content of 78 percent. The analysis estimated an average methane content of 94 percent for transmission and 95 percent for storage. The analysis performed additional calculations and statistical assessments to generate the final statistical analysis and subsequent conclusions.

This analysis found that there is a substantial difference in methane concentrations between (1) gas production, gathering and boosting, and gas processing and (2) transmission and storage. This agrees with earlier data and analyses and the conclusion that there is a difference in the emissions profile between the production and processing segments and the transmission and storage segment.

It should be noted that in regulating HAP from the oil and natural gas industry, the EPA created separate source categories for the production and processing segments, regulated under subpart HH of 40 CFR part 63; and the transmission and storage segment, regulated under subpart HHH of 40 CFR part 63. *See* 64 FR 32610, June 17, 1999. In addition, the EPA has made a similar distinction between other source categories with segments that handle the production and processing of a material and subsequent transport of the product. As the EPA noted in the 2019 Proposal, 84 FR 50258, one example is the petroleum industry, in which production facilities,[31] refineries,[32] and bulk gasoline terminals [33] all have operational differences, and the EPA placed them in three different source categories. Those operational differences are similar to the operational differences between the production and processing segments and the transmission and storage segment at issue in this final rule.

It should be noted that in the 2016 Rule, the EPA justified including the transmission and storage segment in the Crude Oil and Natural Gas source category partly because some similar equipment (*e.g.,* storage vessels, pneumatic pumps, compressors) is used across the industry. While that is true, the differences in the operations of, and the differences in emission profiles of, the different segments support excluding the transmission and storage segment from the source category. A review of 2016 Rule compliance reports from sources in the EPA Regions (3, 6, 8, 9, and 10) with the greatest oil and natural gas activity indicates that there were no storage vessels emitting more than 6 tons per year (tpy) VOC reported in the transmission and storage segment.[34] Therefore, even though there are storage vessels in the transmission and storage segment, the liquids (condensate) stored and the throughputs are such that the VOC emissions are significantly different. This supports our understanding that VOC emissions are lower in the transmission and storage segment and that any gas processing that occurs in the transmission and storage segment generally is limited to removing liquids that condensed during the temperature and pressure changes as the gas moves through the pipeline. In addition, there are types of equipment present in the production segment (*e.g.,* oil tanks, three-phase separators) and processes at natural gas processing plants (*e.g.,* natural gas liquid extraction, natural gas liquids fractionation, sulfur and CO_2 removal) that are either not present or uncommon at natural gas transmission and storage facilities.

In summary, there are distinct differences in the operations between oil and natural gas production and natural gas processing, on the one hand, and natural gas transmission and storage, on the other. The primary operations of the production and processing segments are exploring crude oil and natural gas products beneath the earth's surface, drilling wells that are used to extract these products, and processing the crude oil and field gas for distribution to petroleum refineries and natural gas pipelines. The operations of the production and processing segments differ from the transmission and storage segment operations because in the latter, the natural gas does not undergo changes in composition, except for some limited removal of liquids that condensed during the temperature and pressure changes as the natural gas moves through the pipeline. Second, there are statistically significant differences in the emissions profiles between the production and processing segments and the transmission and storage segment. Third, there are equipment types and processes present in the oil and natural gas production and processing segments that are not present, or not common, at natural gas transmission and storage facilities. The EPA is, therefore, finalizing a revised source category which excludes transmission and storage sources from the Crude Oil and Natural Gas Production source category.

As the EPA stated in the 2019 Proposal, the 2016 Rule's expansion of the source category to include sources in the transmission and storage segment did, in fact, exceed the reasonable boundaries of the EPA's authority to revise source categories. 81 FR 35833. The 2016 Rule also erred in purporting to list, under CAA section 111(b)(1)(A), the source category, as expanded to include transmission and storage sources, for regulation on grounds that it causes or contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. *Id.* Rather, in order to include the transmission and storage segment on the CAA section 111(b)(1)(A) list for regulation, the EPA is required to treat it as a separate source category and determine that in and of itself it causes or contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. The EPA did not make that determination in the course of promulgating the 2016 Rule. 81 FR 35833.

2. Rescission of the NSPS for Sources in Transmission and Storage Segment

A prerequisite for the EPA to promulgate an NSPS applicable to new sources is that the new sources must be in a source category that the EPA has listed under CAA section 111(b)(1). As stated in section V.B.1 of this preamble, the EPA is removing the transmission and storage segment from the source category. Accordingly, the promulgation of NSPS for transmission and storage sources was contrary to law, and as a result, the EPA is also rescinding the standards for both VOC and GHG emissions in the 2012 Rule and the 2016 Rule for emission sources located in the transmission and storage segment. Specifically, we are rescinding the requirements for compressor affected facilities, pneumatic controller affected facilities, storage vessel affected facilities, and the affected facility that is the collection of fugitive emissions components located at a compressor

Industry Using Data Reported Under 40 CFR part 98 Subpart W. April 9, 2020. Included in Docket ID No. EPA–HQ–OAR–2017–0757.

[30] Gathering and boosting is located between well sites and natural gas processing plants in the Oil and Natural Gas Production source category.

[31] U.S. EPA. ''Revised Prioritized List of Source Categories for NSPS Promulgation.'' March 1979. EPA–450/3–79–023.

[32] 38 FR 15406 (May 4, 1973); 39 FR 9315 (March 8, 1974).

[33] 45 FR 83126 (December 12, 1980); 48 FR 37578 (August 18, 1983).

[34] These reports have since been made available for public viewing at *https://www.foiaonline.gov/foiaonline/action/public/submissionDetails?trackingNumber=EPA-HQ-2018-001886&type=request.*

station, where these affected facilities are located downstream of the natural gas processing plant or, if no gas processing plant is present, after the point of custody transfer. To further clarify that the requirements do not apply to these units, we are adding a definition of ''natural gas transmission and storage segment'' which describes the boundaries of the segment. The definitions of ''natural gas processing plant'' and ''custody transfer'' are unchanged.

3. Status of Sources in Transmission and Storage Segment

The result of this final rule, as it relates to the transmission and storage segment, is that these sources are not part of a listed source category under CAA section 111(b)(1)(A) and, thus, are not subject to regulation under CAA section 111(b) (for new sources) or CAA section 111(d) (for existing sources that emit certain air pollutants). This is consistent with the treatment of emissions sources in other industries that the EPA has not listed as a source category under CAA section 111(b)(1)(A). In the future, the EPA may evaluate these emissions more closely and determine whether the transmission and storage segment should be listed as a source category under CAA section 111(b)(1)(A).[35]

4. Rescission of the Limitations on Methane for Sources in the Production and Processing Segments

As the second of the two main actions of this final rule, the EPA is also rescinding the limits on methane emissions for the NSPS applicable to sources in the production and processing segments. The EPA finds that, in the specific circumstances presented here, the EPA erred in establishing the methane NSPS because those requirements are redundant with the NSPS for VOC, establish no additional health protections, and are, thus, unnecessary. Even if the 2016 Rule's establishment of limits on methane emissions is not considered to be, the EPA would exercise its discretion to rescind them on those same grounds. Rescinding the applicability of the 2016 Rule requirements to methane emissions, while maintaining the applicability of those requirements to VOC emissions, will not affect the amount of methane reductions that those requirements will achieve, because the controls that reduce VOC emissions simultaneously reduce methane emissions.

Comments were received on both sides of this proposed decision and the rescission of the requirements for methane and the associated rationale. We respond to some of the major comments in the discussion immediately below and in section VIII.B of this preamble, and to the rest in Chapter 6 of the Response to Comments Document. None of the comments received have led the EPA to materially change its views from the proposal, and as a result, the EPA is rescinding the methane NSPS. The following is the rationale for this decision.

In the 2016 Rule, the EPA justified regulating methane for the following reasons: At the outset, the EPA noted that methane is a GHG, that the EPA has determined that GHG pollution endangers public health and welfare, and that the Crude Oil and Natural Gas Production source category is one of the nation's largest industrial emitters of methane. 81 FR 35825. The EPA also noted that ''[r]educing methane emissions . . . will contribute to efforts to reduce global background ozone concentrations that contribute to the incidence of ozone-related health effects.'' *Id.* at 35837. The EPA went on to determine that the amounts of emissions of methane from the source category were sufficiently large that it was rational to regulate them under CAA section 111, and that, in the alternative, assuming that it was necessary to determine that those emissions cause or contribute significantly to dangerous GHG air pollution, the EPA made that determination as well. *Id.* at 35841–43.

The EPA recognized that the controls that facilities use to meet the VOC NSPS ''also reduce methane emissions incidentally.'' *Id.* at 35841. However, the Agency added that ''in light of the current and projected future GHG emissions from the oil and natural gas industry, reducing GHG emissions from this source category should not be treated simply as an incidental benefit to VOC reduction; rather, it is something that should be directly addressed through GHG standards in the form of limits on methane emissions under CAA section 111(b) based on direct evaluation of the extent and impact of GHG emissions from this source category and the emission reductions that can be achieved through the best system for their reduction.'' *Id.* The Agency added, ''The standards detailed in this final action will achieve meaningful GHG reductions and will be an important step towards mitigating the impact of GHG emissions on climate change.'' *Id.*

The EPA further justified methane requirements by noting that ''there are cost-effective controls that can simultaneously reduce both methane and VOC emissions from these equipment across the industry, and in many instances, they are cost effective even if all the costs are attributed to methane reduction.'' *Id.* In addition, the EPA noted that ''establishing both GHG and VOC standards for equipment across the industry will also promote consistency by providing the same regulatory regime for this equipment throughout the oil and natural gas source category for both VOC and GHG, thereby facilitating implementation and enforcement.'' *Id.* The Agency added that, ''[w]hile this final rule will result in additional reductions [of GHG] . . ., the EPA often revises standards even where the revision will not lead to any additional reductions of a pollutant because another standard regulates a different pollutant using the same control equipment. For example, in 2014, the EPA revised the Kraft Pulp Mill NSPS in 40 CFR part 60 subpart BB published at 70 FR 18952 (April 4, 2014) to align the NSPS standards with the National Emission Standards for Hazardous Air Pollutants (NESHAP) standards for those sources in 40 CFR part 63, subpart S. Although no previously unregulated sources were added to the Kraft Pulp Mill NSPS, several emission limits were adjusted downward. The revised NSPS did not achieve additional reductions beyond those achieved by the NESHAP, but aligning the NSPS with the NESHAP eased the compliance burden for the sources.'' *Id.* n.60.

In *F.C.C.* v. *Fox Television Stations, Inc.,* 556 U.S. 502 (2009), the U.S. Supreme Court described the type of reasoning an agency must provide to justify changing a rule it has previously adopted:

> We find no basis in the Administrative Procedure Act or in our opinions for a requirement that all agency change be subjected to more searching review. The Act mentions no such heightened standard. And our opinion in *Motor Vehicle Mfrs. Assn. of United States, Inc.* v. *State Farm Mut. Automobile Ins. Co.,* 463 U.S. 29 (1983)

[35] Methane emissions from the transmission and storage segment are 34 MMT CO_2 Eq. (1,355 kt methane) per the Inventory of United States Greenhouse Gas Emissions and Sinks: 1990–2018 (published April 13, 2020), which amounts to 5 percent of United States methane emissions and 0.6 percent of total U.S. GHG emissions on a CO_2 equivalent basis (using a GWP of 25 for methane). With respect to VOC emissions, the transmission and storage segment emitted 14 kt in 2017, which amounts to just 5.8 percent of national VOC emissions from that year. With respect to SO_2 emissions, there were 1 kt emitted from the transmission and storage segment in 2017, or just 1.8 percent of national SO_2 emissions. For HAP emissions, the transmission and storage segment emitted 1,143 tons in 2014, or just 0.01 percent of national HAP emissions for that year.

neither held nor implied that every agency action representing a policy change must be justified by reasons more substantial than those required to adopt a policy in the first instance. . . . The statute makes no distinction, however, between initial agency action and subsequent agency action undoing or revising that action.

To be sure, the requirement that an agency provide reasoned explanation for its action would ordinarily demand that it display awareness that it *is* changing position. . . . And of course the agency must show that there are good reasons for the new policy. But it need not demonstrate to a court's satisfaction that the reasons for the new policy are *better* than the reasons for the old one; it suffices that the new policy is permissible under the statute, that there are good reasons for it, and that the agency *believes* it to be better, which the conscious change of course adequately indicates. This means that the agency need not always provide a more detailed justification than what would suffice for a new policy created on a blank slate. Sometimes it must—when, for example, its new policy rests upon factual findings that contradict those which underlay its prior policy; or when its prior policy has engendered serious reliance interests that must be taken into account. *Smiley* v. *Citibank (South Dakota), N. A.,* 517 U.S. 735, 742, 116 S.Ct. 1730, 135 L.Ed.2d 25 (1996). It would be arbitrary or capricious to ignore such matters. In such cases it is not that further justification is demanded by the mere fact of policy change; but that a reasoned explanation is needed for disregarding facts and circumstances that underlay or were engendered by the prior policy.

Id. at 514–16.

In the 2019 Proposal, the EPA acknowledged that in the 2016 Rule, it decided to add methane requirements even though it was aware that the VOC requirements would, by themselves, achieve the same reductions in methane. 84 FR 50259–60 and n.64 (citing 81 FR 35841). However, in that proposal, the EPA nevertheless stated that upon further review, it was proposing that it erred in 2016 by including methane requirements and explained that those requirements were redundant to the VOC requirements. *Id.* The EPA is finalizing this position for several reasons, which meet the requirements of *Fox Television* for reversing the 2016 Rule and rescinding the methane requirements.

In the 2016 Rule, the EPA justified regulating methane on grounds that methane emissions from this source category are great enough to provide a rational basis for regulation in light of the dangers of GHG air pollution and, in fact, if it were necessary, the Agency would determine that those emissions contribute significantly to GHG air pollution. However, in the present action, the EPA is determining that its rational basis finding and alternative SCF in the 2016 Rule were invalid because they included emissions from the transmission and storage segment, as discussed in section VI of this preamble. Accordingly, this basis [36] in the 2016 Rule for regulating methane is invalid.

Considering only the production and processing segments, the 2016 rational basis determination was incorrect because the methane NSPS was redundant on the grounds that it does not achieve any additional methane reductions beyond what sources achieve by implementing the VOC NSPS.[37] The EPA explained its basis for this view at length in the 2019 Proposal, noting that ''for each emission source in the source category subject to the NSPS, the requirements overlap completely.'' 84 FR 50259. The EPA explained that each emission source in the source category emits methane and VOC as co-pollutants through the same emission points and processes. The requirements of the NSPS, including the emission limits, required controls or changes in operations, monitoring, recordkeeping, reporting, and all other requirements, apply to each emission source's emission points and processes and, therefore, to each emission source's methane and VOC emissions, in precisely the same way. The capture and control devices used to meet the NSPS requirements are the same for these co-pollutants and are not selective with respect to either VOC or methane emissions. *Id.* In the proposal, the EPA gave several examples of how the VOC and methane requirements are duplicative of each other. Some examples include the requirements for well affected facilities, pneumatic controllers, pneumatic pumps, and compressors. For each of these emission points, the applicability requirements in NSPS subpart OOOOa are entirely ''pollutant-blind.'' That is, the requirement to control is based on applicability criteria that are not specific to VOC. For example, a pneumatic controller affected facility is a controller operating at a natural gas bleed rate of greater than 6 standard cubic feet per hour (scfh). The ''natural gas'' bleed rate is based on total gas and does not consider the amount of VOC in the gas. In fact, the VOC content could be zero. Similarly, pneumatic pumps are affected facilities if they are ''natural gas driven.'' All reciprocating and wet-sealed compressors, except those at well sites, are affected facilities. Rescission of the methane standards will have no impact on the number of affected facilities that will be subject to the control requirements in NSPS subpart OOOOa. Further, for well completions, pneumatic controllers, reciprocating compressors, and pneumatic pumps at natural gas processing plants, the control requirements are either equipment standards or work practices that do not distinguish between VOC and methane. For pneumatic pumps, the requirement is a 95-percent reduction in ''natural gas emissions.'' Finally, for wet-sealed centrifugal compressors, the requirement is the only one that specifically mentions VOC or methane, as it requires a 95-percent reduction in VOC and methane. However, removal of ''methane'' will not result in any change in methane reduction as the test method required to demonstrate this level of reduction (EPA Method 25A) measures the reduction of total organic carbon, which includes methane.

Thus, after the rescission of the methane standards, there will be no change in the number of affected facilities subject to the rule. There will also be no impact in the methane emission reductions achieved from those sources. While commenters recognized this fact, some raised concerns that in the future, advances in leak measurement technology may result in situations where VOC and methane controls are not redundant. The EPA points out that any future request for an alternative means of emissions limitation must include a demonstration that the alternative identifies emissions for repair that are at least equivalent to the visible emissions observed (and repaired) using optical gas imaging (OGI) with the current levels of sensitivity to methane, especially where the technology speciates emissions. Section VIII.B of this preamble, as well as Chapter 6 of the Response to Comments Document, includes comments and responses on this topic. Because methane reductions occur anyway as a result of the same controls required under the VOC requirements, the benefits of the methane reductions in protecting public health or welfare do not justify regulation of methane under CAA section 111. By the same token, the fact that the controls are cost effective—even, in many cases, when all of the costs are assigned to the methane requirements—does not justify those requirements. Again, the controls, imposed to reduce VOC, would result in the same amount of methane reductions, even without the methane requirements.

Nor can the methane requirements be justified on grounds that their overlap with VOC requirements is a means to

[36] 81 FR 35833.

[37] The same is true for methane reductions that reduce global ozone levels.

promote consistency by providing the same regulatory regime for this equipment throughout the Oil and Natural Gas source category for both VOC and methane, thereby facilitating implementation and enforcement. Although, as noted above, the EPA regulates the same sources/same pollutants at kraft mills under two differing rules, the requirements were established under two different CAA regulatory programs (*i.e.,* under CAA sections 111 and 112) (two different regulatory regimes). The pollutants regulated under CAA section 111(b) for new, modified, or reconstructed emission units at kraft pulp mills are filterable PM and total reduced sulfur compounds. Opacity is regulated to ensure proper operation and maintenance of the electrostatic precipitator used to control PM emissions. Particulate matter emissions and opacity are also regulated under a separate Federal standard, the subpart MM NESHAP for chemical recovery combustion sources at kraft, soda, sulfite, and stand-alone semichemical pulp mills (40 CFR part 63).

It is rational for the EPA to determine that requirements that are redundant to other requirements are not necessary because they do not result in emission reductions beyond what would otherwise occur. As the EPA noted in the 2019 Proposal, the rulemaking to promulgate NSPS for lime manufacturing plants provides another example of the Agency determining not to promulgate a NSPS for an air pollutant, SO_2, on grounds that the emissions were adequately controlled by emissions controls required under a NSPS for another air pollutant, PM. Standards of Performance for New Stationary Sources Lime Manufacturing Plants, 42 FR 22506 (May 3, 1977). Although in that rulemaking, the EPA did not explicitly state that SO_2 controls would have been redundant and, thus, were unnecessary, the Agency's reasoning was fully consistent with that characterization. Specifically, the EPA noted that the controls it was requiring for PM (a baghouse or an electrostatic precipitator) would achieve 85- to 90-percent reductions in SO_2, and that although the EPA could impose further controls to achieve another 7 percent reduction in SO_2, based on the use of a scrubber, the cost would be too high and the environmental benefits too little for that approach to be appropriate. *Id.* at 22507. Accordingly, the EPA prescribed standards for PM but not for SO_2. *Id.* at 22509 (40 CFR 60.342). That is, it appears that the EPA could have promulgated standards for SO_2 that required the same 85- to 90-percent level of control achieved through compliance with the PM standards (and not the additional 7 percent that would have necessitated installation of a scrubber), but the Agency declined to do so. Even though the EPA did not explicitly describe the potential SO_2 NSPS as redundant and, therefore, unnecessary, the fact that it did not promulgate any standards for SO_2 coupled with its explanation that PM controls reduced SO_2 by 85 to 90 percent make clear that the rulemaking serves as a precedent for the present rulemaking and the Agency's present position that the methane NSPS is redundant to the VOC NSPS. By the same token, in the Lime Manufacturing Plants rule, the EPA declined to promulgate NSPS for (1) nitrogen oxides (NO_X) because they are emitted in low concentrations or (2) CO because, among other things, regulation would produce little environmental benefit. *Id.* at 22507. These rationales for not adopting controls for those air pollutants are similar to the redundancy rationale—the essential point in all cases is that any controls would not result in meaningful emission reductions.

In a more recent rulemaking, under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the EPA also declined to promulgate requirements that it considered to be redundant, and the Court upheld that action. Under 42 U.S.C. 9608(b)(1), the EPA is required to ''promulgate requirements . . . that classes of facilities establish and maintain evidence of financial responsibility consistent with the degree and duration of risk associated with the production, transportation, treatment, storage, or disposal of hazardous substances.'' In 2018, the EPA took an action in which it declined to issue financial responsibility regulations for the hardrock mining industry. Financial Responsibility Requirements Under CERCLA Section 108(b) for Classes of Facilities in the Hardrock Mining Industry (Final Action), 83 FR 7556, 7556 (February 21, 2018). As summarized by the Court, the EPA stated that ''existing federal and state programs as well as modern mining practices reduced the risk that the EPA would be required to use the Superfund to finance response actions at currently active mines.'' *Idaho Conservation League* v. *Wheeler,* 930 F.3d 494, 501 (D.C. Cir. 2019) (citing 83 FR 7556). The Court upheld that determination, stating that 42 U.S.C. 9608(b)(1) ''does not place any obligation on the EPA to issue redundant financial responsibility requirements.'' *Id.* at 504–5.[38] [39]

One commenter cites two Court cases that it asserts support the view that the EPA must regulate a source's emissions of a particular pollutant under CAA section 111 even where the source already controls those emissions because of other legal obligations. In *New York* v. *Reilly,* 969 F.2d 1147, 1153 (D.C. Cir. 1992), the Court rejected the EPA's argument that it need not ban the burning of lead-acid vehicle batteries under the NSPS for municipal waste combustors because the Resource Conservation and Recovery Act precludes the burning of lead-acid batteries. The Court responded that ''the mere existence of other statutory authority which might undergird EPA's final stance is insufficient to justify the omission of the battery ban.'' In *Portland Cement Ass'n* v. *EPA,* 665 F.3d 177, 191 (D.C. Cir. 2011), the Court rejected legal challenges to an NSPS limit for PM that tracked a concurrently issued PM standard adopted under CAA section 112. The Court explained that, ''[a]lthough both the NSPS and NESHAP rulemaking resulted in a PM emissions limit of 0.01 pounds per ton, EPA arrived at that limit using two different mechanisms,'' and added that ''the final rule . . . noted that kilns would have to install fabric filter technology to comply

[38] In addition, as the EPA noted in the 2019 Proposal, it ''ha[s] 'historically declined to propose standards for a pollutant [that] is emit[ted] in low amounts . . . .' '' 80 FR 56599 (quoting 75 FR 54970, 54997 (September 9, 2010). This situation is similar to the present situation in which a pollutant (methane) is fully controlled by requirements applicable to a second pollutant (VOC).

[39] The EPA notes that removing the applicability of the NSPS to methane emissions does not alter the basis for the applicability of the NSPS to VOC emissions for affected sources in the source category, which for some affected sources have been regulated since the 2012 Rule. To determine the best system of emission reduction (BSER), the EPA assesses a set of factors, which include the amount of emissions reduction, costs, energy requirements, non-air quality impacts, and the advancement of particular types of technology or other means of reducing emissions, and retains discretion to weight the factors differently in any case. In the 2016 NSPS subpart OOOOa, the EPA gave primary weight to the amount of emission reductions and cost. The EPA describes this analysis in depth in the 2015 NSPS subpart OOOOa proposal at 80 FR 56618 through 56620 and 80 FR 56625 through 56627. For the source types in the production and processing segments, the NSPS requirements, considered on a VOC-only basis, are cost effective (relatively low cost and relatively high emissions reductions). *See* memorandum titled ''Control Cost and Emission Changes under the Amendments to 40 CFR part 60, subpart OOOOa Under Executive Order 13783,'' in the public docket for this action. The EPA provides this information for the benefit of the public and is not reopening the above-described determination in the 2016 NSPS subpart OOOOa that the VOC-only requirements for sources in the production and processing segments meet the requirements of CAA section 111.

with NESHAP, . . . and the parallel NSPS rule would therefore have no additional cost.'' The commenter states that, similarly, while the EPA set the same BSER for methane and VOC in the 2016 Rule, the considerations underlying the BSER analysis differs significantly for these pollutants, which cause distinct harms. However, these cases are distinguishable because they stand for the proposition that when two separate statutory requirements apply, each must be given effect, and compliance with one does not obviate the other. In the present rulemaking, only one statutory requirement is applicable—the CAA section 111(b)(1)(B) requirement to promulgate standards of performance—and the EPA has determined that promulgating a standard of performance for VOC emissions obviates the need for a standard of performance for methane emissions from the same sources. Further, as the EPA noted in the 2019 Proposal, the EPA has historically declined to propose standards for a pollutant that is emitted in small amounts. 84 FR 50260. In the case of the Oil and Natural Gas Production source category, there are no methane emissions from the sources subject to the NSPS beyond those emissions already subject to control by the provisions to control VOC in the NSPS. Accordingly, there is no need to add NSPS requirements applicable to methane.

The EPA recognizes that in rescinding one set of standards in part for its redundancy with another set, the EPA is choosing to rescind the applicability of those standards to methane emissions and not VOC emissions, rather than vice-versa. Rescinding the methane-specific standards is reasonable because the requirements for VOC and correspondingly, sources' compliance with those requirements, are longer established than those for methane. As described earlier, the EPA regulated VOC first, beginning in 1985 and continuing in 2012, and then added regulation of methane for some sources in 2016.

Additionally, redundancy is not uniform across affected facilities in the production and processing segments. All sources in the segments are subject to VOC requirements and many are subject to methane requirements as well. However, some sources, such as storage vessels, are subject only to VOC requirements and not methane requirements. For those sources, it cannot be said that regulation of VOC is redundant to regulation of methane because the EPA has not regulated methane from them. In addition, there are no sources that are subject to only methane requirements. For these reasons, in choosing between the two requirements, the EPA considers it appropriate and less disruptive to rescind the methane standards.

Commenters asserted that the methane NSPS are not redundant to the VOC NSPS because the former trigger the requirements in CAA section 111(d) to regulate methane from existing sources, but the VOC NSPS do not trigger CAA section 111(d) requirements to regulate VOC from existing sources. The commenters noted that the EPA must consider emissions from existing sources when determining whether to list the source category, which is the predicate to regulating a given pollutant under CAA section 111.

The commenters are correct that methane NSPS, but not VOC NSPS, would trigger the CAA section 111(d) requirements for existing sources,[40] but the fact that the methane NSPS carries with it a trigger for CAA section 111(d) regulation of existing sources is simply a legal consequence of the requirements of CAA section 111, and does not undermine the EPA's conclusion that methane NSPS are redundant. Nor does the fact that the EPA considers emissions from existing sources in listing the source category. These conclusions are supported by the structure of CAA section 111. This provision establishes a multi-step process for regulation. Section 111(b)(1)(A) of the CAA directs the EPA to list source categories for regulation, CAA section 111(b)(1)(B) directs the EPA then to promulgate standards of performance for pollutants emitted from new sources, and CAA section 111(d)(1) directs the EPA then to promulgate guidelines for states to adopt standards of performance for certain of those pollutants emitted by existing sources. As explained above and in responses to comments, the basis for rescinding the applicability of the standards of performance for methane emissions is that those NSPS are redundant with the VOC NSPS. The legal consequence of that rescission is that the EPA is not authorized to promulgate CAA section 111(d) guidelines for existing sources. That consequence does not negate the fact that the methane NSPS is redundant with the VOC NSPS.

As discussed in section VII.B of this preamble, the EPA believes that the impact of not regulating existing oil and natural gas sources under CAA section 111(d) will be limited due to existing factors that encourage or require control of emissions from oil and natural gas existing sources. For comments on that view, and the EPA's response to those comments, see section X.B of this preamble.

Additional comments and responses by the EPA on the rescission of the applicability to methane are provided in section VIII.B of this preamble and in Chapter 6 of the Response to Comments Document.

In the next section, the EPA concludes that the 2016 Rule's determination that methane emissions from the source category contribute significantly to dangerous air pollution was erroneous and must be rescinded. Rescinding that determination also requires rescinding the methane NSPS. The redundancy of the methane requirements and the inadequacy of the 2016 Rule's SCF for methane are separate and independent reasons for rescinding the methane NSPS, and, thus, are severable from each other.

VI. Significant Contribution

The EPA is finalizing the position that the Administrator is required to determine that methane emissions from the Crude Oil and Natural Gas Production source category cause or contribute significantly to GHG air pollution as a predicate for promulgating standards of performance for methane. The EPA solicited comment on this position in the 2019 Proposal, based on an interpretation of section 111 of the CAA, and the EPA bases this final action on a refinement of that interpretation. Specifically, the EPA interprets the requirement of CAA section 111(b)(1)(B) that the Administrator propose to ''establish[ ] . . . standards of performance'' and then finalize ''such standards''—together with the CAA section 111(a)(1) definition of ''standard of performance'' as a ''standard for emissions of air pollutants''—to limit the standards of performance to only those air pollutants that the Administrator determined cause or contribute significantly to dangerous air pollution when listing the source category under CAA section 111(b)(1)(A). If the Administrator did not, when listing the source category, determine that a particular air pollutant causes or contributes significantly to dangerous air pollution, then the Administrator must do so as a predicate to promulgating standards of performance for that air pollutant.

Section VI.A of this preamble, immediately below, discusses that interpretation of CAA section 111. In section VI.B of this preamble, we explain how this interpretation applies

[40] In section VII below, we finalize our proposal that VOC NSPS do not trigger CAA section 111(d) requirements.

to the regulation of methane from the Crude Oil and Natural Gas Production source category. In section VI.C of this preamble, we briefly discuss criteria for making a SCF under CAA section 111.

A. Legal Interpretation Concerning the Air Pollutants That Are Subject to CAA Section 111

1. 2019 Proposal

As noted above, CAA section 111 establishes a process for the EPA to regulate air pollutants from industrial source categories. Section 111(b)(1)(A) of the CAA requires the first step: the Administrator must list a particular category of stationary sources that ''causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare,'' and then, under CAA section 111(b)(1)(B), the Administrator must proceed to promulgate standards of performance for that source category. For convenience, we refer to ''air pollution which may reasonably be anticipated to endanger public health or welfare'' as dangerous air pollution, and we refer to the reference to ''causes or contributes significantly'' as the SCF. In the 2019 Proposal, we solicited comment on whether CAA section 111(b)(1)(A) must be read, or reasonably could be read, to require the Administrator to make not only a SCF to list the source category, but also a SCF for a particular air pollutant as a predicate to promulgating a standard of performance for that pollutant under CAA section 111(b)(1)(B).

The EPA supported this interpretation with a detailed discussion of the relevant statutory provisions, their context, and purpose, as well as past administrative practice. At the outset, the EPA acknowledged that CAA section 111(b)(1)(A) by its terms requires that the Administrator make a SCF for the source category, and is silent on individual air pollutants.[41] However, the EPA noted that CAA section 111(b)(1)(A) should be read in conjunction with CAA sections 111(b)(1)(B) and 111(a)(1), which require the Administrator to promulgate ''standards of performance,'' defined as ''standard[s] for emissions of air pollutants.'' The EPA posited that those provisions, read together, by virtue of their focus on emissions of air pollutants, could be interpreted to require or authorize the EPA to require a pollutant-specific SCF as a predicate for promulgating a standard of performance. 84 FR 50263. The EPA acknowledged that in the past it has not promulgated a pollutant-specific SCF, and instead has taken the position that it may promulgate a standard of performance for a pollutant not previously regulated under CAA section 111 as long as it simply has a rational basis for doing so. In the 2019 Proposal, the EPA explained that this approach is flawed because it is vague and not guided by any statutory criteria, and that as a result, it could result in the Agency promulgating standards for air pollutants that are emitted in relatively minor amounts. 84 FR 50263. The Agency stated that interpreting CAA section 111 to require a pollutant-specific SCF as a predicate to regulating the pollutant would guard against this possibility.[42]

2. Comments

The EPA received comment on all aspects of its solicitation of comment. Some commenters supported the EPA's arguments and urged the Agency to finalize an interpretation that requires the Administrator to make a pollutant-specific SCF as a predicate to promulgating standards of performance for that pollutant from a source category. Other commenters opposed this interpretation and sought to counter the support for it that the EPA offered. They argued that under CAA section 111(b)(1)(A), the SCF applies only to source categories. They further argued that the references in CAA sections 111(b)(1)(B) and 111(a)(1) to air pollutants are unremarkable because standards of performance necessarily apply to particular air pollutants, and should not be read to elucidate the meaning of CAA section 111(b)(1)(A) in the manner the EPA suggested.[43] These comments are discussed in more detail in section IX of this preamble and in Chapter 8 of the Response to Comments Document located in the docket for this rulemaking.

3. Final Action

The EPA is finalizing the position that CAA section 111 requires, or at least authorizes the Administrator to require a pollutant-specific SCF as a predicate for promulgating a standard of performance for that air pollutant. The EPA bases this position primarily on a refinement of the interpretation of CAA section 111, described above, on which it solicited comment. Specifically, the EPA interprets the CAA section 111(b)(1)(B) requirement that the Administrator propose to ''establish[ ] . . . standards of performance'' and then finalize ''such standards with such modifications as he deems appropriate,'' in light of both the CAA section 111(a)(1) definition of ''standard of performance'' as a ''standard for emissions of air pollutants,'' and CAA section 111(b)(1)(A), which requires the Administrator to list a source category only ''if in his judgment it causes, or contributes significantly to [dangerous] air pollution.'' Read in this context, CAA section 111(b)(1)(B) is best understood *not* to require the Administrator to promulgate standards for emissions of *all* air pollutants but only to require him or her to promulgate standards for the emissions of air pollutants that the Administrator has determined ''cause or contribute significantly'' to the ''air pollution'' that the Administrator determined to be dangerous when listing the source category. Under this interpretation, if the Administrator did not, in listing the source category, determine that a particular air pollutant causes or contributes significantly to the dangerous air pollution, section 111 requires the Administrator to make—or, at least, authorizes the Administrator to require—a pollutant-specific SCF as a predicate to regulating that air pollutant.[44]

[41] It should be noted that even though CAA section 111(b)(1)(A) is clear in requiring a SCF for the source category, its silence as to individual air pollutants, which of course are what causes or contributes significantly to dangerous air pollution and are the subject of regulation, leaves to the EPA the task of addressing individual air pollutants.

[42] The EPA went on to review other provisions in the CAA that explicitly require a pollutant-specific SCF; the legislative history accompanying these provisions; the references in another CAA section 111 provision, CAA section 111(f)(2)(A) and (B), to the impacts of particular pollutants on dangerous air pollution; and previous interpretations that the EPA had made of the CAA section 111 requirements concerning individual air pollutants. 84 FR 50263–67.

[43] The commenters objected to the EPA's interpretation of other CAA provisions, of legislative history, and of other provisions of CAA section 111, as well as the EPA's interpretations of CAA section 111 in earlier administrative actions. We discuss these comments in the Response to Comments Document located in the public docket of this final rulemaking.

[44] Although this interpretation is a refinement of the interpretation for which the EPA solicited comment in the 2019 Proposal, it is rooted in the Proposal. As noted in the summary above, in supporting the interpretation that CAA section 111(b)(1)(A) requires or authorizes the EPA to require a pollutant-specific SCF, the EPA made numerous references to CAA sections 111(a)(1) and 111(b)(1)(B), and made clear that those three provisions must be read together. The EPA made other references as well to the need to make a pollutant-specific SCF in order to promulgate standards of performance, which is the thrust of the interpretation described in this final action. *See Id.* at 50262–63. The rational basis approach was an interpretation of CAA section 111(b)(1)(B). That is, under this approach, the EPA interpreted that provision to authorize standards of performance for those air pollutants for which the EPA had a rational basis, but not necessarily standards for all air pollutants. *See* 81 FR 35842 (2016 Rule), *cited*

4. Legal Interpretation of CAA Sections 111(a)(1), (b)(1)(B), and (b)(1)(A) and the Pollutants Subject to Regulation

The EPA interprets CAA sections 111(b)(1)(B), in light of CAA sections (b)(1)(A) and (a)(1), to require, or at least to authorize the Administrator to require, a pollutant-specific SCF as a predicate for promulgating a standard of performance for that air pollutant. The EPA bases this interpretation on a close reading of these provisions in the context of CAA section 111. CAA section 111 directs the EPA to regulate, through a multi-step process, air pollutants from categories of stationary sources. CAA section 111(b)(1)(A) requires the initial action, which is that the Administrator must ''publish . . . a list of categories of stationary sources. He shall include a category of sources in such list if in his judgment it causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare.'' This provision does not by its terms require the Administrator, in listing a source category, to identify particular air pollutants of concern that are emitted from the source category, but it does make clear that the Administrator must identify air pollution that is of concern and must make a finding that this air pollution, in our shorthand, is dangerous.

CAA section 111(b)(1)(B) then directs the EPA to propose regulations ''establishing Federal standards of performance'' for new sources within the source category, then to allow public comment, and then to ''promulgate . . . such standards with such modifications as he deems appropriate.'' CAA section 111(a)(1) defines the term ''standard of performance'' as ''a standard for emissions of air pollutants which [the Administrator is required to determine through a specified methodology].'' This definition makes clear that the standards of performance that CAA section 111(b)(1)(A) directs the Administrator to promulgate must concern air pollutants emitted from the sources in the source category. However, industrial sources of the type subject to CAA section 111(b)(1)(A) invariably emit more than one air pollutant and neither CAA section 111(b)(1)(B) nor 111(a)(1) by its terms specifies for which of those air pollutants the EPA must promulgate standards of performance.

But the statute does provide guidance as to the class of air pollutants for which the EPA must promulgate standards of performance. Section 111(b)(1)(A) of the CAA demonstrates that the statutory scheme of CAA section 111 is aimed at controlling ''air pollution which may reasonably be anticipated to endanger public health or welfare.'' It follows that the air pollutants for which the Administrator must establish standards must, or at least may reasonably, be limited to those air pollutants which contribute to this dangerous air pollution.

The Administrator's discretion to limit the class of air pollutants for which he promulgates standards is supported by his statutory discretion under CAA section 111(b)(1)(B) to finalize standards ''with such modifications as he deems appropriate.'' In an exercise of this discretion, the Administrator deems it appropriate to limit the standards of performance to those air pollutants that contribute to dangerous air pollution.

Several other provisions in CAA section 111 also refer to air pollutants, including CAA section 111(b)(3), which requires the Administrator to, ''from time to time, issue information on pollution control techniques for categories of new sources and air pollutants subject to the provisions of this section.'' This reference to ''air pollutants *subject to the provisions of this section*'' (emphasis added) implies that some air pollutants may not be subject to CAA section 111; otherwise, the emphasized phrase would be superfluous.[45]

As noted in the 2019 Proposal, in the past, the EPA has interpreted CAA section 111(b)(1)(B) to authorize it to promulgate standards of performance for any air pollutant that the EPA identified in listing the source category and any additional air pollutant for which the EPA has identified a rational basis for regulation. 81 FR 35843 (2016 Oil & Gas Methane Rule); ''Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units—Final Rule,'' 80 FR 64510 (October 23, 2015) (EGU CO_2 NSPS Rule). Inherent in this approach is the recognition that CAA section 111(b)(1)(A) does not, by its terms, necessarily require the EPA to promulgate standards of performance for all air pollutants emitting from the source category. Citizen group stakeholders and some states have endorsed the rational basis approach. Some industry stakeholders and other states, however, have advocated a narrower approach with respect to, at least, the GHG for which the EPA promulgated standards of performance for the Fossil Fuel-Fired Electric Utility Generating Units source category and the Crude Oil and Natural Gas Production source category. The stakeholders argued that under this narrower approach, the EPA is not authorized to promulgate NSPS for at least GHG unless it first makes a SCF with respect to that pollutant.

The EPA interprets the phrase at issue in CAA section 111(b)(1)(B), ''standards of performance,'' and the associated phrase in CAA section 111(a)(1), ''emissions of air pollutants,'' by analogy to the similar phrase, ''any air pollutant,'' found in the CAA permitting provisions that the U.S. Supreme Court considered in *Utility Air Regulatory Group* v. *EPA,* 573 U.S. 302 (2014) (*UARG*). In *UARG,* the Court interpreted CAA section 169(1), which provides construction and modification permitting requirements under the Prevention of Significant Deterioration (PSD) program, and CAA sections 501(2)(B) and 302(j), which provide the operating permit requirements of the title V program. The Court concluded that when read in the context of the permitting provisions, the phrase ''any air pollutant'' did not encompass GHG, even though they are air pollutants. The EPA considers that the analytical approach that the Court adopted in *UARG* also applies to CAA section 111(b)(1)(B). Under this approach, the provisions in that section that direct the Administrator to establish ''standards of performance'' for new sources in the source category, require, or at least reasonably allow, the Administrator to promulgate standards for only those air pollutants for which the EPA has made a SCF.

The EPA considers the same analytical approach to support interpreting ''emissions of air pollutants'' in CAA section 111(a)(1) to encompass only those air pollutants for which the EPA has made a SCF. Under the PSD requirements, no ''major emitting facility'' may be constructed or

in 84 FR 50262 (2019 Proposal). This approach is similar to the pollutant-specific SCF approach. By the same token, the EPA's discussions in the 2019 Proposal of the legislative history, CAA section 111(f), and previous statements the EPA made in support documents all contain references to a pollutant-specific SCF as a predicate for promulgating standards of performance. 84 FR 50263 through 67.

[45] Similarly, CAA section 111(d)(1)(A) makes clear by its terms that ''a standard of performance under this section'' need not govern *all* pollutants emitted from a regulated source to give effect to Congress's purpose. The requirements of CAA section 111(d)(1)(A) apply to only a subset of air pollutants, that is, ''any air pollutant . . . for which air quality criteria have not been issued or which is not included on a list published under section 7408(a) of this title or emitted from a source category which is regulated under section 7412 of this title but . . . to which a standard of performance under this section would apply if such existing source were a new source.''

modified in certain areas of the U.S. unless it has received a permit that includes certain conditions and emission limits. CAA section 165(a)(1). In the PSD definitional provisions, CAA section 169(1) defines the term ''major emitting facility'' as any stationary source of air pollutants that emits, or has the potential to emit, at least 100 or 250 tpy (depending on the source) of ''any air pollutant.'' *See* CAA sections 169(2)(C), 111(a)(4) (defining ''construction'' to include ''modification,'' which in turn is defined to mean, in relevant part, a certain type of change that increases the amount of ''any air pollutant'' emitted by the source). Title V makes it unlawful to operate a ''major source'' without an operating permit that includes all applicable CAA requirements. Title V defines a ''major source'' by incorporating the CAA-wide definition of ''major stationary source:'' A stationary source that emits or has the potential to emit at least 100 tons per year of ''any air pollutant.'' CAA section 501(2)(B), 302(j).

In a 2010 rule, ''Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule,'' 75 FR 31514 (June 3, 2010) (Tailoring Rule), the EPA took the position that the phrase ''any air pollutant'' in these provisions necessarily included GHG, based on the 2007 decision by the U.S. Supreme Court that the CAA-wide definition of ''air pollutant,'' CAA section 302(g), encompasses GHG. *Massachusetts* v. *EPA,* 549 U.S. 497 (2007). The EPA's interpretation, however, created practical problems, which the Agency recognized in the Tailoring Rule: It would cause numerous commercial and small industrial sources to become subject to the permitting requirements, which were burdensome and which Congress designed to apply only to large industrial sources that were equipped to carry those burdens. *UARG,* 573 U.S. at 310–11 (citing 73 FR 44355, 44498 and 99).

UARG held that the EPA's interpretation of the PSD and title V provisions was unreasonable, and that the phrase ''any air pollutant'' in these provisions did not include GHG. The Court adopted a two-step analysis. First, the Court found that the fact that the CAA-wide definition of ''air pollutant'' included GHG did not mean that all the references to ''air pollutant'' in the CAA's operative provisions necessarily include GHG; rather, whether the term included GHG was dependent on the context of the particular operative provision. 573 U.S. at 316. The Court found support for this position in the fact that ''where the term 'air pollutant' appears in the Act's operative provisions, EPA has routinely given it a narrower, context-appropriate meaning.'' *Id.* The Court explained that the EPA had already interpreted ''any air pollutant'' in the permitting provisions to be limited to ''regulated'' air pollutants, which the Court described as ''a reasonable, context-appropriate meaning.'' *Id.* at 316–17. The Court identified several other provisions ''where EPA has inferred from statutory context that a generic reference to air pollutants does not encompass every substance falling within the Act-wide definition.'' For example, and of particular significance here, the Court noted that CAA section 111(a)(4), read together with CAA sections 111(a)(2) and (b)(1)(B), applies NSPS requirements to a source that undergoes a physical or operational change that increases its emission of ''any air pollutant,'' but the EPA interprets this provision as limited to air pollutants for which the EPA has promulgated standards of performance. 573 U.S. at 317. Similarly, the Court noted that CAA sections 169A(b)(2)(A) and (g)(7) require a certain type of source that interferes with visibility to retrofit if it has the potential to emit 250 tpy of ''any pollutant,'' but that the EPA interprets this provision as limited to visibility-impairing air pollutants. 573 U.S. at 318. The Court emphasized that *Massachusetts* did not call these interpretations into question; rather, according to the Court, ''*Massachusetts* does not foreclose the Agency's use of statutory context to infer that certain of the Act's provisions use 'air pollutant' to denote not every conceivable airborne substance, but only those that may sensibly be encompassed within the particular regulatory program.'' 573 U.S. at 319. Therefore, in this first step, the Court concluded that the CAA did not compel the EPA to interpret the phrase ''any air pollutant'' in the permitting provisions to include GHG.

Second, the Court found that the EPA did not have the discretion to interpret this phrase to include GHG, because it was unreasonable to do so in light of the permitting provisions. The Court explained that including GHG would expand the permitting programs to large numbers of small sources, but that ''a brief review of the relevant statutory provisions leaves no doubt that the PSD program and Title V are designed to apply to, and cannot rationally be extended beyond, a relative handful of large sources capable of shouldering heavy substantive and procedural burdens.'' *Id.* at 322. The Court went on to describe the various PSD and title V statutory requirements that are resource-intensive and time-consuming, and, therefore, incompatible with application to large numbers of small sources. *Id.* at 322–23.

The EPA is adopting *UARG's* two-step analytical approach to conclude that, in light of its context, CAA section 111(b)(1)(B) does not mandate, and cannot reasonably be read to authorize, the EPA to promulgate standards of performance for an air pollutant for which the EPA has not made a SCF. At a minimum, even if these provisions are not read to preclude the EPA from promulgating standards of performance without first making a pollutant-specific SCF, it is reasonable to interpret these provisions as authorizing the EPA to decline to promulgate standards without first making such a SCF. *UARG* was explicit that provisions of CAA section 111 are subject to its analytical approach. As noted above, the Court endorsed the EPA's interpretation that, notwithstanding the reference to ''any air pollutant'' in CAA section 111(a)(4), the requirements concerning a ''modification'' in CAA section 111(b)(1)(B), which is at issue here, and CAA sections 111(a)(2) and (4) do not require the EPA to promulgate standards for every pollutant that a modified source emits, because those provisions must be understood in context to embrace a limited set of air pollutants. 573 U.S. at 317.

As is clear from the EPA's summary above of the CAA section 111 rulemaking process, the first action that the EPA must take, specified in CAA section 111(b)(1)(A), is to list a source category for regulation on the basis of a determination that the category contributes significantly to dangerous air pollution, and it is this provision that establishes the context that is relevant for present purposes. This provision makes clear that although Congress designed CAA section 111 to apply broadly to source categories of all types wherever located, Congress also imposed a constraint: The EPA is authorized to regulate only sources that it finds cause or contribute significantly to air pollution that the EPA finds to be dangerous.

Congress' direction to EPA to promulgate standards of performance for the sources in the category, under CAA section 111(b)(1)(B), must be viewed in this context. Congress did not specify which air pollutants the standards of performance must address, stating only, as noted above, in the definitional provisions of CAA section 111 that the term ''standard of performance'' means a standard for ''emissions of air pollutants.'' This phrase is substantially similar to the phrase ''any air pollutant'' in the PSD and Title V provisions addressed in *UARG.* In fact, ''emissions of air pollutants'' appears to be less encompassing than ''any air pollutant.'' As the U.S. Supreme Court has noted, ''Read naturally, the word 'any' has an expansive meaning, that is, 'one or some indiscriminately of whatever kind.' Webster's Third New International Dictionary 97 (1976).'' *United States* v. *Gonzales,* 520 U.S. 1, 4, 1997), *quoted in Department of Housing and Urban Development* v. *Rucker,* 535 U.S. 125, 131 (2002), *cited in Massachusetts,* 549 U.S. at 529 n.25.

Under the analytical approach of *UARG,* because the regulatory scope of the CAA's ''operative provisions,'' such as CAA sections 111(b)(1)(B) and 111(a)(1), must be understood in context, their reference to ''standards of performance'' and ''emissions of air pollutants'' cannot be read to mandate promulgation of standards of performance for each and every air pollutant emitted from the source category. In addition, because Congress limited the EPA to regulating only stationary sources in a category that the Administrator must first determine to cause or contribute significantly to dangerous air pollution, it is not reasonable to read ''air pollutants'' to refer to any of the source category's air pollutants for which the EPA has not made a SCF. At the very least, it is reasonable to interpret that phrase more narrowly. As noted in the 2019 Proposal, interpreting the CAA section 111 provisions to authorize the EPA to regulate any air pollutant, even ones that the EPA did not consider in listing the source category, creates the risk that the EPA may regulate air pollutants emitted in small quantities or otherwise having little adverse effect.[46]

It is true that, recently, the EPA has adopted the approach of regulating additional air pollutants that it did not address in the listing determination only after determining that it has a rational basis for doing so, and in making that determination, has considered the same factors as it would in making a SCF. 81 FR 35843 (2016 Rule). However, this approach is a creature of Agency practice and, therefore, is not as firmly established as statutory requirements. As noted in the 2019 Proposal, interpreting CAA section 111 to require only a pollutant-specific rational basis standard, and not a SCF, could lead to potentially anomalous results when the Agency, after listing a source category on grounds that its emissions taken together contribute significantly to dangerous air pollution, proceeds to promulgate NSPS for individual air pollutants. EPA stated that, as an example, under the rational basis interpretation, the EPA could list a source category on grounds that it emits numerous air pollutants that, taken together, significantly contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, and proceed to regulate each of those pollutants, without ever finding that each (or any) of those air pollutants by itself causes or contributes significantly to—or, in terms of the text of other provisions, causes or contributes to—air pollution that may reasonably be anticipated to endanger public health or welfare. 84 FR 50263. As further noted in the 2019 Proposal, CAA section 111(b)(1)(A) does not provide or suggest any criteria to define the rational basis approach, the EPA has not articulated any criteria in its previous applications in the EGU CO_2 NSPS and the 2016 subpart OOOOa rules, and in instances before those rules in which the EPA has relied on the ''rational basis'' approach, the EPA has done so to justify not setting a standard for a given pollutant, rather than to justify setting such a standard. *Id.* Thus, the rational basis test allows the EPA virtually unfettered discretion in determining which air pollutants to regulate. As a result, the rational basis standard creates the possibility that the EPA could seek to promulgate NSPS for pollutants that may be emitted in relatively minor amounts, as the EPA noted in the 2019 Proposal. 84 FR 50263. As noted in section IX below, numerous commenters reiterated these concerns.

In contrast, CAA section 111(b)(1)(A) is clear that the EPA may list a source category for regulation only if the EPA determines that the source category ''causes or contributes *significantly*'' (emphasis added) to dangerous air pollution. In light of the stringency of this statutory requirement for listing a source category, it would be unreasonable to interpret CAA section 111(b)(1)(B) to allow the Agency to regulate air pollutants from the source category merely by making an administrative determination under the open-ended and undefined rational basis test. Rather, it is logical to interpret CAA section 111(b)(1)(B) to require that the Agency apply the same degree of rigor in determining which air pollutants to regulate as it does in determining which source categories to list for regulation.

For these reasons, the EPA concludes that in the context of CAA section 111, the requirement that the EPA promulgate ''standards of performance,'' (CAA section 111(b)(1)(B)), defined as ''standard[s] for emissions of air pollutants'' (CAA section 111(a)(1)), must be interpreted to require a pollutant-specific SCF (CAA section 111(b)(1)(A)) as a predicate for promulgating standards of performance. At a minimum, the Agency considers this interpretation to be reasonable and, accordingly, adopts it. Requiring a pollutant-specific SCF establishes a clearer framework for assessing which air pollutants merit regulatory attention that will require sources to bear control costs. This promotes regulatory certainty for stakeholders and consistency in the EPA's identification of which air pollutants to regulate and reduces the risk that air pollutants that do not merit regulation will nevertheless become subject to regulation due to an unduly vague standard.

In the 2019 Proposal, the EPA solicited comment on whether to interpret CAA section 111(b)(1)(A) to require a determination that the pollutant causes or contributes significantly to dangerous air pollution (the SCF) or instead, to interpret it to require a determination that the pollutant simply causes or contributes to dangerous air pollution. 84 FR 50261. The same issue arises with respect to CAA sections 111(b)(1)(B) and (a)(1), but the EPA has concluded that interpreting these provisions to require a SCF as the pollutant-specific finding is consistent with the source-category SCF in CAA section 111(b)(1)(A). That is, in light of Congress' clearly expressed intent in CAA section 111(b)(1)(A) that the EPA base its listing of a source category on a finding that the emissions from the source category contribute significantly to dangerous air pollution, the EPA concludes that CAA sections 111(b)(1)(B) and (a)(1) require the EPA to base its regulation of a pollutant on a similarly rigorous finding that the pollutant contributes significantly to dangerous air pollution. If, in the alternative, the statute is ambiguous in this regard, the EPA exercises its

[46] As should be clear from this discussion immediately above, this interpretation of CAA sections 111(b)(1)(B) and (a)(1) differ from the interpretation of CAA section 111(b)(1)(A) that the EPA described in the 2019 Proposal. *See* 84 FR 50263 (stating that interpreting CAA section 111(b)(1)(B), the EPA was mindful that an Agency ''[may] avoid a literal interpretation at Chevron step one . . . [by] show[ing] either that, as a matter of historical fact, Congress did not mean what it appears to have said, or that, as a matter of logic and statutory structure, it almost surely could not have meant it'' (citation omitted)).

discretion to interpret it to require a pollutant-specific SCF.

In the 2019 Proposal, the EPA noted that interpreting CAA section 111 to require a pollutant-specific SCF as a predicate to regulation ''need not result in duplicative SCFs (or duplicative associated endangerment findings). That is, the EPA would not need to make separate SCFs (and associated endangerment findings) for both the source category and each pollutant emitted by the source category that the EPA seeks to regulate.'' 84 FR 50266. The EPA continues to hold this view. In identifying any new source categories under CAA section 111(b)(1)(A), the EPA could identify each air pollutant of concern and make a SCF, as appropriate, for emissions of each of those pollutants from the source category, and, in that same action, make the SCF for the source category itself. In addition, in the 2019 Proposal, the EPA solicited comment on what implications interpreting CAA section 111 to require a pollutant-specific SCF would give rise to for already promulgated standards of performance. *Id.* The EPA believes that standards of performance will generally not be affected by this requirement because generally, the EPA identified and analyzed the air pollutants of concern when the EPA listed a source category, or initiated promulgation of standards of performance at the same time or shortly after listing the source category, and, therefore, in association with the significance determination the Agency made in that listing. For example, as noted elsewhere, the EPA followed that process when it listed the Crude Oil and Natural Gas Production source category, that is, it identified and analyzed the air pollutants of concern at that time in the supporting documents. Importantly, the EPA relied on its analyses of those air pollutants as the basis for determining that the source categories' emissions contribute significantly to dangerous air pollution.[47]

B. Flaws in the 2016 Rule's Significant Contribution Finding

When the Administrator listed the oil and natural gas industry as a source category in 1979, he did not determine that methane emissions from the source category cause or contribute significantly to dangerous air pollution. In this rulemaking, the EPA is taking the position that the EPA must make that determination as a predicate to promulgating standards of performance for methane from this source category. The Administrator did determine in the 2016 Rule that methane from the source category contributes significantly to dangerous air pollution, but that determination was flawed and must be rescinded for two reasons: (1) The Administrator made that determination on the basis of methane emissions from the production, processing, and transmission and storage segments, instead of just the production and processing segments; and (2) the Administrator failed to support that determination with either established criteria or some type of reasonably explained and intelligible standard or threshold for determining when an air pollutant contributes significantly to dangerous air pollution.

1. Improper Scope of Source Category

In the 2016 Rule, the Administrator made the significant contribution finding on the basis of assessing methane emissions from the source category as defined to include the production, processing, and transmission and storage segments. In the present action, we are removing the transmission and storage segment, leaving only the production and processing segments. Because the 2016 Rule did not assess whether methane emissions from the production and processing segments alone cause or contribute significantly to dangerous air pollution, we find that the Rule's determination is not adequate and, therefore, we are rescinding it. Until the EPA makes an appropriate determination that methane emissions from the Oil and Natural Gas source category, properly calculated, contribute significantly to dangerous air pollution, it does not have authority to promulgate standards of performance for methane from these sources under CAA section 111(b)(1)(b).

2. Lack of Criteria or Standard for Determining Significant Contribution

In the 2019 Proposal, the EPA ''solicit[ed] comment on the question of whether the SCF in the 2016 . . . [R]ule can be considered appropriate given that nowhere in the course of developing and promulgating that rule did the EPA set forth the standard by which the 'significance' of the contribution of the methane emissions from the source category (as revised) was to be assessed.'' 84 FR 50267. The EPA elaborated that it was asking for comment on whether, as a matter of law, under CAA section 111, the EPA is obligated to identify the standard by which it determines whether a source category's emissions ''contribute significantly,'' and whether, if not so obligated, the EPA nevertheless fails to engage in reasoned decision-making by not identifying that standard. *Id.* The EPA cited *Motor Vehicle Mfrs. Assn. of United States, Inc.* v. *State Farm Mut. Automobile Ins. Co.,* 463 U.S. 29, 43 (1983), which states, ''Normally, an agency rule would be arbitrary and capricious if the agency has . . . entirely failed to consider an important aspect of the problem.''. *Id. See Department of Homeland Security* v. *Regents of Univ. of Cal.,* No. 18–587, slip op. at 18 (U.S. June 18, 2020) (executive action to rescind the Deferred Action for Childhood Arrivals program failed to provide a reasoned explanation when it failed to consider certain ''conspicuous issues''). For the reasons that follow, the EPA concludes that the failure to identify any such standard or any established set of criteria for the 2016 Rule's SCF for methane emissions from the source category is unreasonable and requires rescinding the 2016 Rule's SCF.

As the EPA noted in the 2019 Proposal, the ''contributes significantly'' provision in CAA section 111(b)(1)(A) is ambiguous. *See* 84 FR 50267–68 (citing *EPA* v. *EME Homer City Generation, L.P.,* 572 U.S. 489 (2014) (holding that a similar provision in CAA section 110(a)(2)(D)(i), often termed the ''good neighbor'' provision, is ambiguous)). Accordingly, the EPA has authority to interpret that provision. *Id.* at 50268. As noted above, the EPA reads CAA section 111(b)(1)(B) in light of CAA sections 111(b)(1)(A) and (a)(1) to incorporate the ''contributes significantly'' standard in connection with promulgating NSPS for particular air pollutants. The EPA has concluded that to allow the EPA to distinguish between a *contribution* and a *significant contribution* to dangerous pollution, some type of (reasonably explained and intelligible) standard and/or established set of criteria that can be consistently applied is necessary. Without at least one or the other, it is impossible to evaluate whether the SCF is well reasoned. Therefore, the lack of a standard or established set of criteria for the 2016 Rule's SCF renders the finding arbitrary and capricious. A supporting basis for this conclusion can be found in the EPA's analysis of the ''contribute significantly'' provisions of CAA section 189(e), concerning major stationary sources of PM with a diameter of 10 micrometers or less (PM_{10}). This provision requires that the

[47] The EPA also took the approach in the 2016 Rule that it is revising here, when it attempted to expand the Crude Oil and Natural Gas Production source category. It discussed the pollutant emissions, including GHG, VOC, and SO_2, made a SCF for those emissions, and, on the basis of that SCF, listed the expanded source category. 81 FR 35837 through 40.

control requirements applicable to major stationary sources of PM_{10} also apply to major stationary sources of PM_{10} precursors ''except where the Administrator determines that such sources [of precursors] do not contribute significantly to PM_{10} levels which exceed the standard in the area.'' As the EPA noted in the 2019 Proposal, in CAA section 189(e), Congress intended that, in order to be subject to regulation, the emissions must have a greater impact than a simple contribution not characterized as a significant contribution. However, Congress did not quantify how much greater. Therefore, the EPA developed criteria for identifying whether the impact of a particular precursor would ''contribute significantly'' to a NAAQS exceedance. 84 FR 50268. These criteria included numerical thresholds. *Id.*

The EPA has concluded similarly that, under CAA section 111(b), a standard or an established set of a criteria, or perhaps both, are necessary to identify what is significant and what is not. Moreover, without either, any determination of significance is arbitrary and capricious because it does not identify a reasoned basis for that determination.[48] This is evident in the flawed significance finding in the 2016 Rule. There, the EPA determined that ''the collective GHG emissions from the oil and natural gas source category are significant'' and based that determination on several facts concerning the amount of methane emissions from the Oil and Gas source category, in comparison to other domestic and global emissions. Specifically, the EPA stated that oil and gas GHG emissions are significant, whether the comparison is (i) ''domestic'' (noting that this sector is ''the largest source of methane emissions, accounting for 32 percent of United States methane and 3.4 percent of total United States emissions of all GHG''), (ii) ''global'' (noting that this sector, ''while accounting for 0.5 percent of all global GHG emissions, emits more than the total national emissions of over 150 countries, and combined emissions of over 50 countries''), or (iii) ''when both the domestic and global GHG emissions comparisons are viewed in combination.'' 81 FR 35840. The EPA did add a qualitative assessment of those facts. It noted that ''no single GHG source category dominates on the global scale,'' noted further that the oil and natural gas source category, ''like many (if not all) individual GHG source categories, could appear small in comparison to total emissions,'' and asserted that nevertheless, ''in fact, it is a very important contributor in terms of both absolute emissions, and in comparison to other source categories globally or within the United States.'' *Id.* However, the EPA did not identify any set of criteria by which to evaluate those facts and to ensure that those facts constituted the comprehensive set of data for determining significance. In contrast, when the EPA determines whether an area should be designated nonattainment on grounds that it ''contributes'' to ambient air quality problems in a nearby area, the EPA applies an established set of criteria that identify the relevant sets of data to analyze and explain how to analyze them. *See Catawba Cty.* v. *EPA,* 571 F.3d 20, 39–40 (DC Cir. 2009) (*Catawba*) (holding that in determining whether an area ''contributes'' to downwind ozone air quality problems, the EPA, ''[t]o be reasonable . . . must . . . define and explain the criteria the agency is applying''; explaining that the EPA adopted a set of nine criteria that it defined and explained ''in spades''). These criteria help ensure that the EPA's decision-making is well-reasoned and consistent. The EPA considers it particularly important to develop a set of criteria and/or a standard in order to determine when a *significant* contribution occurs, in order, as noted above, to distinguish it from a simple contribution. A contribution can be greater or lesser and remain a contribution, but a significant contribution determination necessarily involves a judgment about the degree of the contribution that rises to the level of significance. For such a judgment to be meaningful (and to be understood by regulated parties and by the public), the Agency must identify the criteria it will use to determine significance. In the 2016 Rule's significance finding, the EPA did not identify such criteria.

Nor did the EPA identify any threshold against which to compare the cited facts concerning methane emissions, and thereby assess their importance, much less explain why a contribution above such a threshold should be deemed significant while a contribution below it should not. Thus, for example, although the EPA justified the significance determination, in part, on grounds that the source category's emissions constitute 3.4 percent of total U.S. GHG emissions and 0.5 percent of all global GHG emissions, the EPA did not explain why either of those facts supports the significance determination. Because the EPA did not identify a threshold or criteria for evaluating the oil and gas industry's percentage of domestic or global GHG emissions, the EPA could not justify the 2016 Rule's SCF. As a result, that determination cannot be considered the result of reasoned and appropriate decision-making.[49] The EPA intends to begin

[48] As noted in the 2019 Proposal, in a 1994 rule concerning CAA section 213(a), which requires the EPA to make a finding that air pollutant emissions from new and existing nonroad engines and vehicles are ''significant contributors'' to dangerous air pollution, the EPA determined that it is not necessary to establish a ''specific numerical standard'' for determining significance. 84 FR 50268 (citing 59 FR 31306 and 31308 (June 17, 1994)). However, more recently, as further noted in the 2019 Proposal, the EPA promulgated criteria to interpret and apply ''contribute significantly'' in the ''good neighbor'' provision, CAA section 110(a)(2)(D)(i). 84 FR 50267 and 68 (discussing the criteria and the EPA's use of them in the Cross State Air Pollution Rule, which the U.S. Supreme Court upheld in *EPA* v. *EME Homer City Generation, LP.,* 572 U.S. 489 (2014)). In *Coalition for Responsible Regulation* v. *EPA (CRR),* the Court considered a challenge to the EPA's 2009 determination under CAA section 202(a) that GHG air pollution may reasonably be anticipated to endanger public health and welfare (the GHG Endangerment Finding) on grounds that the EPA had failed to quantify a threshold amount of GHG air pollution that would be safe and that, as a result, the EPA had no basis for concluding that the current amount may endanger. 684 F.3d 102, 122–23 (DC Cir. 2012), *aff'd in part and rev'd in part on other grounds sub nom. Utility Air Regulatory Group* v. *EPA,* 573 U.S. 302 (2014). The Court upheld the GHG Endangerment Finding, concluding that the EPA based it on an overall assessment of risk—accounting for ''the precautionary thrust of the CAA and the multivariate and sometimes uncertain nature of climate science''—for which no quantitative threshold is necessary. *Id.* at 123. That case is distinguishable because it focused on the endangerment finding for GHG air pollution, not on the amount of contribution that GHG emissions make to that air pollution. In any event, the contribution requirement of section 202(a)(1) requires only a simple contribution determination, not a significant contribution.

[49] In the EGU CO_2 NSPS Rule, the EPA determined, in the alternative, that CO_2 emissions from fossil fuel-fired EGUs contribute significantly to dangerous air pollution. The EPA explained that fossil fuel-fired EGUs ''emit almost one-third of all U.S. GHG emissions, and are responsible for almost three times as much as the emissions from the next ten stationary source categories combined.'' The EPA added that ''[t]he CO_2 emissions from even a single new coal-fired power plant may amount to millions of tons each year,'' and that ''the CO_2 emissions from even a single NGCC unit may amount to one million or more tons per year.'' The EPA also asserted that in that rulemaking, ''[i]t is not necessary'' for the EPA ''to decide whether it must identify a specific threshold for the amount of emissions from a source category that constitutes a significant contribution.'' The EPA explained that ''under any reasonable threshold or definition, the emissions from combustion turbines and steam generators are a significant contribution.'' 80 FR 64531. In 2018, the EPA proposed to revise the EGU CO_2 NSPS Rule, and solicited comment on whether a SCF for GHG emissions from fossil fuel-fired EGUs was a necessary predicate for promulgating a NSPS for those emissions. ''Review of Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units—Proposed Rule, 83 FR 65424, 65432 n.25 (December 20, 2018). While the EPA has not taken final action

Continued

rulemaking shortly to identify thresholds and/or criteria and to apply them in future significance determinations.

Commenters objected that the 2016 Rule's SCF should not be considered invalid due to the lack of a standard by which to assess significant contribution, citing *Mississippi Commission on Envtl. Quality* v. *EPA,* 790 F.3d 138 (D.C. Cir. 2015) (*Mississippi*), the most recent decision in the line of cases that includes *Catawba,* noted above. In that line of cases, the Court upheld the EPA's approach to determining whether, under CAA section 107(d)(1)(A)(i), an upwind area should be treated as nonattainment because it ''contributes'' to downwind air quality problems. *See Mississippi,* 790 F.3d at 150 (citing *Catawba,* 571 F.3d at 39–40). The Court held that the EPA was not required to establish a threshold level of impact for determining whether an upwind area ''contributes'' to a downwind area. The *Mississippi* Court cited *Catawba,* 571 F.3d at 39–40), which commenters, in turn, cite to argue that such a threshold is not necessary for determining a significant contribution under CAA section 111(b). However, as noted above, the EPA had ''define[d] and explain[ed]'' a set of criteria for determining whether an upwind area ''contributes,'' and in the cited case law, the Court found that these criteria facilitated the reasonableness of the EPA's decision-making. *Catawba,* 571 F.3d at 39–40. In any event, this case law is distinguishable because it concerns the EPA's determination under CAA section 107(d)(1)(A)(i) of a simple contribution, whereas CAA section 111(b) requires the EPA to determine a *significant* contribution. As noted above, the EPA considers it particularly important to develop a set of criteria and/or a standard in order to determine when a significant contribution occurs, in order to distinguish it from a simple contribution.

C. Criteria for Making a Significant Contribution Finding Under CAA Section 111

In the 2019 Proposal, the EPA solicited comment regarding criteria for the Agency to consider in making a SCF. 84 FR 50267. The solicitation for comment was not on the factors the Agency should consider in determining whether air pollution may reasonably be anticipated to endanger public health or welfare, but rather the factors that should be considered when determining under CAA section 111 whether a pollutant from a source category significantly contributes to that air pollution. Several commenters recommend that the EPA defer any action on SCF criteria and suggest the EPA undertake these questions in a separate future rulemaking. Some commenters suggest specific criteria the EPA could consider.

The EPA made clear in the 2019 Proposal that it would not finalize criteria in this rulemaking, but rather would conduct a separate rulemaking to do so. 84 FR 50267. There is no need for the EPA to promulgate criteria at this time because this rule rescinds NSPS. The EPA expects that in the future, it will promulgate criteria before promulgating additional NSPS.

It should be noted that several commenters contend that oil and gas methane emissions are too small to be considered ''significant.'' For example, some commenters cite as support that the contribution of oil and gas methane to total U.S. GHG emissions is only about 3 percent, that U.S. methane emissions are only about 7 percent of global methane emissions, and that U.S. methane emissions are only about 1 percent of global GHG emissions. The EPA appreciates the commenters' views concerning the amounts and impacts of methane emissions from the transmission and storage segment, as well as the production and processing segments. The EPA acknowledges that depending on the criteria that it adopts to support a SCF in the future, such a relatively small contribution to the national and global pool of methane emissions may not be deemed significant. But until the EPA itself reviews and assesses those amounts of emissions according to the criteria that it eventually adopts, the EPA cannot make a determination as to whether methane emissions from the production and processing segments contribute significantly to dangerous air pollution.

VII. Implications for Regulation of Existing Sources

As discussed in section VII of the proposal preamble, the EPA recognizes that by rescinding the applicability of the NSPS, issued under CAA section 111(b), to methane emissions for the sources in the Crude Oil and Natural Gas Production source category that are currently covered by the NSPS, existing sources of the same type in the source category will not be subject to regulation under CAA section 111(d). This is a legal consequence that results from the application of the CAA section 111 requirements. Comments were received that both agreed and disagreed with the proposed decision and reflected varying opinions on the implications for regulation of existing sources. These comments are provided, along with the EPA's responses, in section X of this preamble and in Chapter 9 of the Response to Comments Document. None of the comments received resulted in a material change in the EPA's rationale and conclusions from proposal. The following provides a summary of the EPA's legal interpretation of CAA section 111(d)(1) and rationale for why the lack of regulation of existing sources under CAA section 111(d) will have a limited environmental impact.

A. Existing Source Regulation Under CAA Section 111(d)

As the EPA stated at proposal (see section VII of the 2019 Proposal preamble), CAA section 111(d) authorizes the regulation of existing sources in a source category for particular air pollutants to which a standard of performance would apply if those existing sources were new sources. By legal operation of the terms of CAA section 111(d), certain existing sources in the Crude Oil and Natural Gas Production source category will no longer be subject to regulation under CAA section 111(d) as a result of this final rule. Under CAA section 111(d)(1)(A), CAA section 111(d) applies only to air pollutants (1) for which air quality criteria have not been issued, and which are not on the EPA's list of air pollutants issued under CAA section 108(a) (commonly referred to as the ''CAA 108(a) exclusion''), and (2) which are not HAP emitted from a source category regulated under CAA section 112 (commonly referred to as the ''CAA 112 exclusion''). *See* 42 U.S.C. 7411(d)(1)(A) (CAA section 111(d) applies to ''any air pollutant (i) for which air quality criteria have not been issued or which is not included on a list published under section 7408(a) of this title or emitted from a source category which is regulated under section 7412 of this title'').

For reasons set out in the proposal preamble, the EPA has concluded that VOC fall within the CAA 108(a) exclusion and, thus, are not the type of air pollutant that, if subjected to a standard of performance for new sources, would trigger the application of CAA section 111(d). VOC are not expressly listed as CAA section 108(a) pollutants, but they are precursors to photochemical oxidants (*e.g.,* ozone) and PM, both of which are listed CAA section 108(a) pollutants. As provided in CAA section 302(g), the term ''air pollutant'' is defined to include

for that rule, the unique CO_2 emissions profile of fossil fuel-fired EGUs should be noted: The volume of emissions from EGUs dwarfs the amount of GHG emissions from every other source category.

precursors ''to the extent that the Administrator has identified such precursor or precursors for the particular purpose for which the term 'air pollutant' is used.'' For the following reasons, it is appropriate to consider VOC within the scope of photochemical oxidants and PM, which are listed CAA section 108(a) pollutants, for the particular purpose of applying the CAA section 108 exclusion in CAA section 111(d).

First, VOC are regulated through the CAA's NAAQS implementation program established under CAA section 110, as a result of the inclusion of ozone and PM on the CAA section 108(a) list, because VOC are precursors to those two listed pollutants. See, *e.g.,* CAA section 182(b)(2) (establishing ''reasonably available control technology'' requirements for VOC sources in moderate ozone attainment areas); CAA section 182(c)(2)(b) (requiring serious ozone areas to submit a reasonable further progress demonstration that will account for a set amount of VOC emissions reductions); CAA section 182(d)(2) (requiring specific VOC reductions to satisfy the offset requirement for severe areas); CAA section 182(e)(1) (requiring specific VOC reductions to satisfy the offset requirement for extreme areas). Indeed, the regulation of ozone precursors is the means of addressing ozone in the ambient air, because ozone levels in the ambient air are the result of photochemical reactions of precursors (VOC and NO_X), as opposed to being directly emitted from sources.

Second, as explained in the proposal preamble, excluding VOC from regulation under CAA section 111(d) makes sense within the CAA's three-part structure for addressing emissions from stationary sources. As the EPA has discussed in past rulemakings, the CAA sets out a comprehensive scheme for air pollution control, addressing three general categories of pollutants emitted from stationary sources: (1) Criteria pollutants (which are addressed in CAA sections 108 through 110); (2) hazardous pollutants (which are addressed under CAA section 112); and (3) ''pollutants that are (or may be) harmful to public health or welfare but are not or cannot be controlled under [CAA] sections 108–110 or 112.'' ''Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units: Final Rule,'' 80 FR 64661, 64711 (October 23, 2015) (quoting 40 FR 53340 (November 17, 1975)). Within this three-part structure, CAA section 111(d) is properly understood as a ''gap-filling'' measure to address pollutants that are not addressed under either the criteria pollutant and NAAQS implementation provisions in CAA sections 108 through 110 or the HAP provisions in CAA section 112. Because VOC are regulated as precursors to ozone and $PM_{2.5}$ under CAA sections 108 through 110, they are properly excluded from regulation under CAA section 111(d) because the ''gap-filling'' function of CAA section 111(d) is not needed.

Third, reading the phrase ''included on a list published under [CAA section 108(a)]'' as including precursors is reasonable in light of the provision in CAA section 112(b)(2) that restricts what pollutants may be listed as CAA section 112 HAP.

Finally, as discussed in detail in the proposal preamble, the fact that precursors are not always treated as CAA section 108(a) listed pollutants under all contexts across the CAA does not undermine the conclusion that they should be excluded under the CAA section 108 exclusion in CAA section 111(d).

B. Impact of Lack of Regulation of Existing Oil and Natural Gas Sources Under CAA Section 111(d)

The EPA maintains its position from the proposed rule that the lack of regulation of existing sources under CAA section 111(d) through an Emission Guideline (EG) will have limited impact. This is because there are several factors that will continue to contribute to the downward trend of total methane emissions from oil and natural gas existing sources even in the absence of an EG.

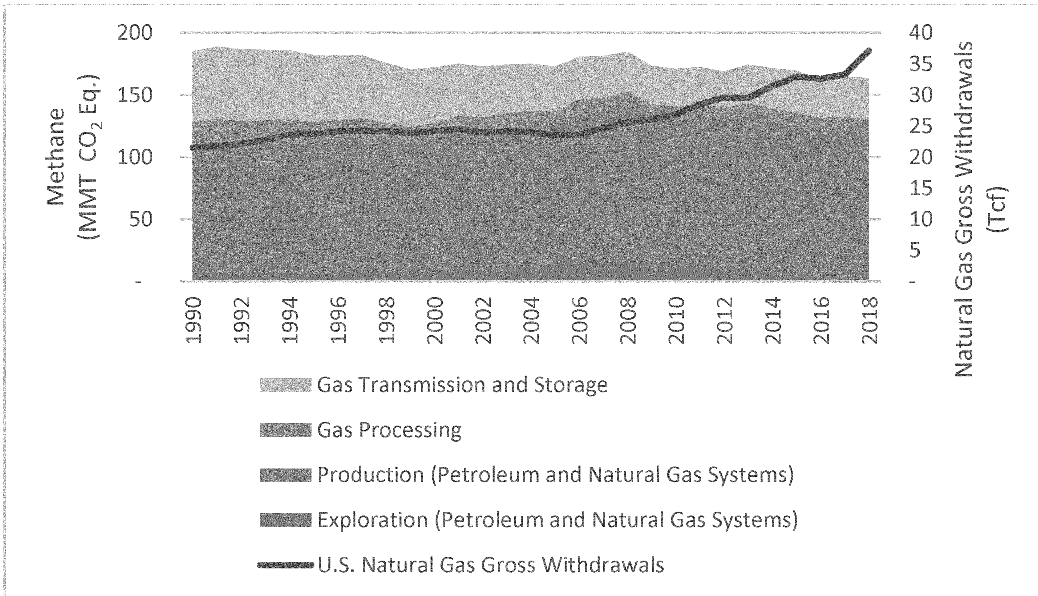
First, as the EPA stated in the 2019 Proposal preamble, the 2016 Rule includes a definition and approach to determining new source applicability that are very broad, and in the specific context of the oil and natural gas production industry, can be anticipated to result in wide applicability of the NSPS to existing sources due to the frequency with which such sources can be reasonably expected to engage in ''modification'' activity. Specifically, it would take at least 7 years from date of promulgation of an EG for requirements to be fully implemented.[50] During this time, the EPA expects that a percentage of existing sources will shut down or undertake modification which will result in them becoming subject to regulation under CAA section 111(b). However, based on limited information that commenters submitted, the EPA acknowledges there may be some existing sources that have never been modified and accepts that these are examples of existing sources that have continued to operate for long periods of time without being reconstructed or modified. The EPA did not prepare and include a quantitative analysis that estimates the levels at which source modification/equipment turnover may occur. However, the EPA maintains that this is one factor (among other factors) that in the absence of an EG will continue to contribute to the downward trend of total methane emissions from oil and natural gas existing sources.

Secondly, there are market incentives for the oil and natural gas industry to capture as much natural gas (and, by extension, methane) as is cost effective. Depending on the future trajectories of natural gas prices and the costs of natural gas capture and emission reductions, market incentives may continue to drive emission reductions, even in the absence of specific regulatory requirements applicable to methane emissions from existing sources. Assessing the relationship of methane emissions and natural gas production, overall natural gas gross withdrawals have increased about 50 percent from 1990 to 2018, while aggregate methane emissions from the NSPS subpart OOOOa-relevant industry segments have stayed relatively flat (Figure 1). This trend indicates decreasing aggregate methane emissions intensity for these segments over this period (Figure 1). These trends are likely driven by a combination of economic and technical advances.

[50] This estimation considers the development of states' plans and the Federal plan. Unlike NSPS, EG are not directly enforceable; thus, these mechanisms are critical for implementation.

[51] Methane emissions from Table 3–37 (Petroleum Systems) and Table 3–57 (Natural Gas Systems) in U.S. EPA. 2020. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2018. EPA 430–R–20–002. Available at: *https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2018.* Accessed July 1, 2020. U.S. Energy Information Administration (EIA) data on natural gas gross withdrawals available at: *https://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_FGW_mmcf_a.htm.* Accessed July 1, 2020.

FIGURE 1. NET EMISSIONS OF METHANE EMISSIONS (FROM 2020 GHGI) and U.S. NATURAL GAS GROSS WITHDRAWALS IN TRILLION CUBIC FEET (TCF) (FROM U.S. ENERGY INFORMATION ADMISTRATION NATURAL GAS DATA), 1990 TO 2018.[51]



While environmental performance is a challenging concept to quantify in monetary terms, improving such performance is increasingly important for firms that seek to maintain a ''social license to operate.'' Generally speaking, the social license to operate means that the firm's employees, investors, customers, and the general public find that the firm's business activities and operations are acceptable to continue to freely participate in the marketplace. Maintaining the social license by improving environmental performance, such as reducing emissions, can help firms respond to the complex environment within which they operate in ways that are favorable to their longer-term business interests.

Third, the EPA maintains, and has received a substantial amount of comments confirming its position that participation in the various voluntary methane emissions mitigation programs is one factor (among other factors) that in the absence of an EG that will continue to contribute to the downward trend of total methane emissions from oil and natural gas existing sources. Owners and operators of facilities in the oil and natural gas industry participate in voluntary programs that reduce their methane emissions. Specifically, many owners and operators of facilities participate in two EPA partnership programs: The Natural Gas STAR Program[52] and the Methane Challenge Program.[53] Owners and operators also participate in voluntary programs that are not administered by the EPA, such as the Environmental Partnership[54] and the Climate and Clean Air Coalition (CCAC) Oil & Gas Methane Partnership.[55] Firms might participate in voluntary environmental programs for a variety of reasons, including attracting customers, employees, and investors who value more environmentally responsible goods and services; finding approaches to improve efficiency and reduce costs; and reducing pressures for potential new regulations or helping shape future regulations.[56] [57] The EPA does acknowledge that the industry as a whole is not uniformly meeting voluntary measures at the same level of control and that some companies may not be participating in cited voluntary methane emissions programs at all. This makes it difficult to verify the impacts on emissions as a result of voluntary program participation. Additional time will be needed to allow these programs to further develop and to be fully implemented to better quantify the impacts the varied programs have on

[52] The Natural Gas STAR Program started in 1993 and seeks to achieve methane emission reductions through cost-effective best practices and technologies. Partner companies document their voluntary emission reduction activities and report their accomplishments to the EPA annually. Natural Gas STAR includes over 100 partners across the natural gas value chain and has eliminated nearly 1.39 trillion cubic feet of methane emissions since 1993.

[53] The Methane Challenge Program, started in 2016 and designed for companies that want to adopt more ambitious actions for methane reductions, expands the Natural Gas STAR Program through specific, ambitious commitments; transparent reporting; and company-level recognition of commitments and progress. This program includes more than 50 companies from production, gathering and boosting, transmission and storage, and distribution.

[54] The Environmental Partnership is composed of various companies of different sizes and includes commitments to replace all high-bleed pneumatic controllers with low-bleed controllers (*i.e.,* controllers with a bleed rate less than 6 scfh) within 5 years, require operators to be on-site or nearby when conducting liquids unloading, and require initial monitoring for fugitive emissions at all sites within 5 years, with repairs completed within 60 days of fugitive emissions detection. *https://theenvironmentalpartnership.org/.*

[55] The CCAC Oil and Gas Methane Partnership is a technical partnership between oil and natural gas companies, the Environmental Defense Fund, the EPA Natural Gas STAR Program, and the Global Methane Initiative that provides technical documents on a wide variety of opportunities for reducing methane emissions and requires annual progress reports from its participants. Yearly data on the progress being made by participants is available on the CCAC website. *http://ccacoalition.org/en/content/oil-and-gas-methane-partnership-reporting.*

[56] Borck, J.C. and C. Coglianese (2009). ''Voluntary Environmental Programs: Assessing Their Effectiveness.'' Annual Review of Environment and Resources. 34(1): 305–324.

[57] Brouhle, K., C. Griffiths, and A. Wolverton (2009). ''Evaluating the role of EPA policy levers: An examination of a voluntary program and regulatory threat in the metal-finishing industry.'' Journal of Environmental Economics and Management. 57(2): 166–181.

reducing emissions from oil and natural gas industry sources.

Fourth, several major oil and natural gas producing states have established regulations on oil and natural gas sector emissions. The EPA recognizes that state requirements vary in stringency and that only a subset of states include requirements for sources that the EPA could potentially define as existing sources. However, states that have standards applicable to existing sources include California, Colorado, Utah, Wyoming (in the Upper Green River Basin ozone non-attainment area), and Texas, and account for a substantial portion of oil [58] and natural gas production [59] in the United States. Furthermore, current state regulations (and permits) controlling VOC emissions will concurrently reduce methane emissions from the oil and natural gas industry. For example, areas that are designated Moderate nonattainment and above for certain ozone NAAQS, and states within the Ozone Transport Region, are required to adopt and implement VOC controls for oil and gas sources covered by the EPA's 2016 Control Techniques Guidelines.[60] These controls, which the EPA will address through the state implementation plan (SIP) approval process, will concurrently reduce methane emissions.

As with other factors cited by the EPA, existing source state requirements are one factor (among others) that in absence of an EG will continue to contribute to the downward trend of total methane emissions from oil and natural gas existing sources. Further detail regarding comments received on the potential for limiting emissions from existing sources can be found in section X of this preamble.

VIII. Summary of Major Comments and Responses

In this section, we respond to many of the major comments made on the 2019 Proposal. In the Response to Comments Document in the docket, we provide additional discussion for some of these comments, and respond to additional comments.

A. Revision of the Source Category To Remove Transmission and Storage Segment

1. History of Scope of Oil and Natural Gas Source Category

Comment: Commenters assert that language in CAA section 111 demonstrates that Congress contemplated that source categories would be broad and encompass a variety of different types of emission sources. The commenters disagree that the 1979 listing did not include the natural gas transmission and storage segment, and add that, in 1980, the Agency explained: ''Source categories are intended to be broad enough in scope to include all processes associated with the particular industry.'' Commenters state that, in practice, the EPA has long listed broad source categories, covering an entire industry or a source that may be found in numerous industries, and sometimes establishing different subcategories within source categories, including electric utilities, non-metallic mineral processing, and compressor engines. The commenters contend that the EPA's treatment of other source categories soon after the priority listing process consistently recognized the interrelatedness of facilities or of emissions controls for those facilities and that this helps determine what sources to include in each source category. Although petroleum refineries are a separate source category under CAA section 111, the commenters note that the EPA previously explained that the source category for the asphalt roofing industry ''encompasses not only asphalt roofing plants but certain production units at oil refineries and asphalt processing plants which were not included on the Priority List promulgated on August 21, 1979.'' 45 FR 76405.

Response: The EPA has generally exercised discretion in identifying the scope of any particular industry, including which industrial processes it includes, for purposes of treating it as a source category under CAA section 111.[61] The EPA acknowledges that some of the listed source categories were broad in scope. However, the EPA has also listed source categories that are relatively narrow in scope—they have distinct facility boundaries that encompass a particular process that, in turn, follows a linear path and results in a specific product. Examples of narrowly defined source categories include the following.

- *Primary Copper Smelting, Subpart P:* A primary copper smelter is any installation or any intermediate process engaged in the production of copper from copper sulfide ore concentrates through the use of pyrometallurgical techniques. The affected facilities in primary copper smelters are dryers, roasters, smelting furnaces, and copper converters.
- *Nitric Acid Plants, Subpart G and Ga:* A nitric acid plant is a nitric acid production unit, which, in turn, is any facility producing weak nitric acid by either the pressure or atmospheric pressure process.
- *Kraft Pulp Mills, Subparts BB and BBa:* A kraft pulp mill is any stationary source which produces pulp from wood by cooking (digesting) wood chips in a water solution of sodium hydroxide and sodium sulfide (white liquor) at high temperature and pressure. Regeneration of the cooking chemicals through a recovery process is also considered part of the kraft pulp mill. The affected sources are digester systems, brown stock washer systems, evaporator systems, condensate stripper systems, recovery furnaces, smelt dissolving tanks, and lime kilns at kraft pulp mills.
- *Sulfuric Acid Plants, Subpart H:* The affected sources are sulfuric acid production units. These are defined as any facility producing sulfuric acid by the contact process by burning elemental sulfur, alkylation acid, hydrogen sulfide, organic sulfide and mercaptans, or acid sludge, but do not include facilities where conversion to sulfuric acid is utilized primarily as a means of preventing emissions to the atmosphere of sulfur dioxide or other sulfur compounds.

If the EPA does not originally include in a listing certain processes, and subsequently seeks to include those processes, the EPA must make the requisite statutory findings in order to do so. The action that the commenters cite supports this point. In the original 1979 Priority List, the EPA listed the Asphalt Roofing Plants source category. Subsequently, based on studies on the asphalt roofing industries, the EPA determined that the initial processing of asphalt for roofing manufacture may take place at sources other than asphalt roofing plants. Accordingly, the EPA, through rulemaking, amended the 1979 source category listing to include additional locations such as asphalt processing plants and asphalt storage tanks at oil refineries. *See* 45 FR 76427 and 28. In doing so, the EPA provided a specific rationale for broadening the source category. The present situation

[58] Approximately 52 percent of crude oil production in 2019 according to *https://www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbblpd_a.htm.*

[59] Approximately 35 percent of natural gas production in 2019 according to *https://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_VGM_mmcf_a.htm.*

[60] On October 27, 2016, the EPA provided notice of the availability of a final control techniques guideline document titled *Control Techniques Guidelines for the Oil and Natural Gas Industry* (EPA 453/B–16–001). 81 FR 74798 (October 27, 2016).

[61] The EPA has not relied on particular formulations, such as standard industrial classification, to identify an industry for purposes of classifying it.

requires a similar analytical framework: (1) The original source category listing for Crude Oil and Natural Gas Production was not broadly defined to include transmission and storage, and (2) the requisite statutory findings have not been made to expand the category to include it.

Comment: Several commenters assert that nothing in the 1979 listing decision supports the EPA's claim that the Agency at the time viewed facilities used in natural gas transmission and storage (*e.g.,* stationary pipeline compressor engines) as a separate source category.

Another commenter asserts that the omission in the 1979 listing of a source in the transmission and storage segment that had been included in the 1978 technical document suggests that this source was incorporated into the Crude Oil and Natural Gas Production source category. The commenter states that, while the EPA studied Stationary Pipeline Compressor Engines, which are found in the transmission and storage segment, as a potential independent source category in the 1978 technical document,[62] this source was not listed as a major or minor source in the 1979 Listing.[63] The commenter states that, while the Agency argues that the source was included in the Stationary Internal Combustion Engines listing, the EPA supports this proposition only by citing to a 2008 rule, which does not expressly include stationary pipeline compressor engines within the Stationary Internal Combustion Engines source category.[64] The commenter notes that the EPA cites to a page stating that ''[c]ategories and entities potentially regulated by this action'' include ''[a]ny manufacturer that produces or any industry using a stationary internal combustion engine as defined in the final rule.'' 73 FR 3568 and 69. The preamble contains a list of ''[e]xamples of regulated entities'' that includes ''[n]atural gas transmission.'' 73 FR 3569. However, according to the commenter, the applicability criteria of the final rule contains no explicit reference to stationary pipeline compressor engines.

Response: As a general matter, the Agency has the authority to revisit its prior categorization determinations. Nonetheless, the EPA, upon a close read of its prior rules believes that this and certain other comments on prior Agency determinations are mistaken, as described further in this section. The EPA notes that while it believes the 1979 listing did not include the transmission and storage segment for the reasons described in this final rule, any interpretation otherwise (*i.e.,* that the listing did include this segment) did not have any practical effect until the 2012 Rule, when the EPA promulgated standards for this segment for the first time. Therefore, to the extent the 1979 listing can be considered to have included the transmission and storage segment, the EPA is alternatively determining that such inclusion was incorrect for the same reasons why the 2012 and 2016 Rules incorrectly included the segment as part of the source category.

The EPA disagrees with the commenter's suggestion that the 1979 listing incorporated stationary pipeline compressor engines into the Crude Oil and Natural Gas Production source category. This is clearly evidenced by examining the pollutants which are identified for the category. For the 1979 listing, the pollutants identified for the Crude Oil and Natural Gas Production source category were VOC and SO_2. In the 1978 background documentation, the pollutants identified for stationary pipeline compressor engines were NO_X, SO_2, and carbon monoxide (CO). If the EPA had included stationary pipeline compressor engines in the Crude Oil and Natural Gas Production source category in 1979, the Agency likely would have added NO_X and CO to the list of pollutants for the category.

That the Stationary Internal Combustion Engine rule (40 CFR part 60, subpart IIII) covers engines in the natural gas transmission and storage segment is further evidenced by the statement from the February 26, 2008, **Federal Register** document that specifically identifies engines in natural gas transmission as example entities subject to the rule. The commenter is incorrect in asserting that the applicability criteria of the regulations are silent on engines in natural gas transmission. Those applicability criteria are *characteristics* of the engine (*e.g.,* maximum engine power), which are unrelated to the *location* of the engine (*e.g.,* in the transmission segment). *See* § 60.4230 of 40 CFR part 60, subpart JJJJ. Therefore, the lack of explicit mention of the transmission segment does not mean that engines in that segment are not included in the category.

Comment: Several commenters stated that the description of the Crude Oil and Natural Gas Production source category in the 1984 proposed NSPS for VOC and SO_2 emissions made clear that the category did not include transmission and storage operations. The commenters pointed to the statement in the preamble that the source category excluded emission sources related to the ''distribution'' of products ''to petroleum refineries and gas pipelines'' (citing, *e.g.,* 49 FR 2636.

Other commenters disagree. One commenter asserts that the EPA defined the source category as ''encompass[ing] the operations of exploring for oil and natural gas products, drilling for these products, removing them from beneath the earth's surface, and processing these products from oil and gas fields for distribution to petroleum refineries and gas pipelines.'' The commenter states that it is clear that compressor stations within the transmission and storage segment ''process these products . . . for distribution'' by compressing the gas and forcing it through the pipelines.

Response: The EPA does not agree with the commenter's interpretation of the quotation from the 1984 proposal. Specifically, the EPA does not agree that the compression of the natural gas along transmission pipelines constitutes processing of the natural gas. Natural gas processing has historically been defined by the Agency to include the extraction of natural gas liquids from field gas, fractionation of mixed natural gas liquids to natural gas products, or both. (40 CFR part 60, subpart KKK; 40 CFR part 63, subpart HH). The EPA maintains that the language in the 1984 proposal, *i.e.,* that the category includes ''the operations of exploring for oil and natural gas products, drilling for these products, removing them from beneath the earth's surface, and processing these products from oil and gas fields for distribution to petroleum refineries and gas pipelines,'' is not ambiguous. Following the well-defined ''processing'' operations, the natural gas enters transmission gas pipelines. These are the gas pipelines referred to in the 1984 preamble, meaning that the gas leaves the processing segment of the oil and natural gas production source category and travels to the next segment, the natural gas transmission pipelines.

Comment: One commenter asserts that, within the 1984 definition of the production segment, the EPA drew a definitional boundary whereby production consisted of extraction ''and processing [of oil and natural gas] for distribution to petroleum refineries and gas pipelines.'' The commenter states that this implies that the boundary at which the Agency has always historically defined the category as being where production meets local distribution to pipelines or refineries. The commenter states that this interpretation of the CAA meant that the

[62] U.S. EPA. Priorities for New Source Performance Standards Under the Clean Air Act Amendments of 1977. April 1978. EPA–450/3–78–019. p. 33.

[63] 44 FR 49222 through 49226.

[64] 73 FR 3568, 3569 (January 18, 2008).

production segment abuts the distribution end of the industry—not an arbitrarily created ''Transmission and Storage'' segment.

Response: The EPA's use of the term ''distribution'' in the 1984 preamble was misinterpreted by the commenter. The commenter appears to interpret ''distribution'' as the distribution segment of the natural gas industry, and that the source category includes everything up to that segment. In the context of the 1984 preamble, the EPA's use of the term ''distribute'' means the transfer to the next segment of the industry.

Comment: A commenter asserts that the 1984 proposal serves to demonstrate that the EPA did not view its listing as constrained to its literal terms—''Crude Oil and Natural Gas Production''— because the 1985 NSPS regulated the processing, not the production, segment of the natural gas industry. Specifically, the EPA stated that, with regard to the discussion of equipment leaks, ''equipment used in crude oil and natural gas production (not to be confused with natural gas processing) for equipment leaks of VOC is not appropriate for widely dispersed equipment.'' 49 FR 2637. The commenter states that, taken to a literal extreme, the proposal's argument would mean that the 1985 NSPS exceeded the scope of the source category and was, thus, unlawful.

Response: The EPA agrees that the language that the commenter quotes indicates the Agency's view in the 1985 NSPS that the source category covered both production and processing. However, this does not in turn mean that the Agency thought that the source category included the transmission and storage segment as well. As described above, the 1984 proposal acknowledged equipment leaks in the production segment but declined to set standards for them based on a technical analysis. This discussion makes clear that the Agency considered production to be part of the source category. In contrast, as discussed above, the preamble is silent on equipment leaks in the transmission and storage segment.

Comment: Further, the commenter states that the EPA's proposal appears to concede that the Agency has never been limited to regulating only those specific sources within the listed category that it regulated in the first NSPS. The commenter states that, prior to 2012, the EPA had issued standards for emissions at gas processing plants only as part of the ''Crude Oil and Natural Gas Production.'' The commenter notes that in 2012 the EPA regulated VOC from previously unregulated upstream sources, including well completions, centrifugal compressors, reciprocating compressors, pneumatic controllers and storage vessels (citing 77 FR 49490 (Final Rule promulgating 40 CFR part 60, subpart OOOO)). The commenter states that these sources were not part of the EPA's analysis in 1979 or 1984 NSPS, yet the proposal does not suggest that they were improperly regulated in the 2012 Rule. Specifically, in 2012 the EPA stated: ''[i]n addition to the operations covered by the existing standards, the newly established standards will regulate volatile organic compounds from gas wells, centrifugal compressors, reciprocating compressors, pneumatic controllers and storage vessels'' (citing 77 FR 49490).

The commenter also indicates that the EPA's citation to the 1984 NSPS ignores other statements made during other rulemakings for the source category, including the same 1984 rulemaking, that suggest that the source category was intended to cover broadly the oil and natural gas sector, or at least was not limited to production and processing (citing 84 FR 50256). The commenter states that, in that NSPS, the EPA felt the need to exclude specifically certain sources found in the transmission and storage segment from the standards it set, something that would not have been necessary if the Agency had intended to exclude these segments themselves from the definition of the source category. The sources excluded in that NSPS are compressor stations, dehydration units, sweetening units, underground storage facilities, and field gas gathering systems, unless the facility is located at an onshore natural gas processing plant.

Response: The commenter's representation of the 1984 rulemaking is not entirely accurate. It is true that the 1984 proposal limits the sources covered to those at natural gas processing facilities. However, the EPA does not agree that this rulemaking was an expansion of the original ''Crude Oil and Natural Gas Production'' source category. The commenter is implying that natural gas processing operations were not included in the original source category listing in 1979 but does not provide any evidence from the 1978/1979 actions to support that assertion. An alternative interpretation of this text could also be that the Agency wished to make it sufficiently clear that while sources in part of the production and processing segment are included in the source category, the same sources that are part of the transmission and storage segment are not included in the source category. However, in the absence of an explanation for this exclusion, the most that can be taken away from this text is that these sources are not subject to the 1984 NSPS; this text alone is not dispositive on whether these sources are included in the broader Oil and Natural Gas source category. Therefore, the commenter extrapolates a conclusion without a basis to do so. The fact that SO_2 was a pollutant identified for the Crude Oil and Natural Gas Production source category clearly shows that processing was included, as the sweetening units covered by the 1984 proposed rules are the primary source of SO_2 emissions in the oil and natural gas industry.

In addition, there are numerous statements made by the EPA throughout the 1984 proposal that clearly demonstrate consideration of sources across the entire Crude Oil and Natural Gas Production source category. The commenter cites the statement in the1984 proposal that emission points can be divided into three categories and uses this statement to argue that the source category included transmission and storage. However, the comment fails to include the remainder of the paragraph that includes that statement:

> These emission points can be divided into three main categories: Process, storage, and equipment leaks. Process emission sources include well systems, field oil and gas separators, wash tanks, steeling tanks, and other sources. *These process sources remove the crude oil and natural gas from beneath the earth and separate gas and water from the crude oil. Best demonstrated control technology has not been identified for these process emission points; therefore, these sources have not been considered in developing the proposed standards.* 49 FR 2637 (emphasis added).

This part of the paragraph clarifies two points. First, the EPA clearly considered the upstream sources (well systems, field oil and natural gas separators, etc.) as part of the source category but indicated that since best demonstrated control technology had not been identified for those sources, no standards were being proposed at that time. These sources were then addressed in the 2012 rulemaking, when the best demonstrated technology/BSER had been determined for them. Second, this discussion did not mention operations in the transmission segment.

One commenter also refers to the parenthetical in the 1984 proposal related to oil and natural gas production and argues that it is proof that natural gas processing was not included in the Crude Oil and Natural Gas Production source category. The following provides more of the discussion to provide the full context.

> Equipment leaks of VOC can occur from pumps, valves, compressors, opened ended

lines or valves, and pressure relief devices used in onshore crude oil and natural gas production. These leaks usually occur due to design or failure of the equipment. Equipment used in crude oil and natural gas production (not to be confused with natural gas processing) are widely dispersed over large areas. The analysis presented in the BID for the principal control technique (leak detection and repair work practices) for equipment leaks of VOC is not appropriate for widely dispersed equipment. The costs and emission reduction numbers for such an analysis are unknown at this time. Thus, the proposed standards do not apply to equipment associated with crude oil and natural gas production. The proposed standards apply only to equipment located at onshore natural gas processing plants. 49 FR 2637.

Taking the 1984 preamble excerpt in context illustrates that the distinction made between production and processing was specifically related to the application of leak detection and repair work practices for equipment leaks and not to define the source category. In fact, the discussion makes it clear that the EPA's definition of the source category includes production and processing. Again, there is no mention here of the application of leak detection and repair programs to the transmission and storage segment.

Finally, the commenter cites a paragraph from the proposed regulation, which clarifies that sources not located at a natural gas processing plant are not affected facilities, as evidence that the category includes the transmission and storage segment, since ''compressor stations'' are included. This is also not a compelling argument. It is not uncommon for equipment, other than that used to extract natural gas liquids from field gas or to fractionate mixed natural gas liquids to natural gas products, to be located at a natural gas processing plant. This paragraph—40 CFR 60.630(e)—simply clarifies that if other operations (*i.e.,* compressor stations, dehydration units, sweetening units, underground storage facilities, field gas gathering units, and liquefied natural gas units) are located at a natural gas processing plant, the associated components are subject to the leak detection and repair requirements in NSPS subpart KKK. This list cannot be extrapolated to the conclusion that the EPA considered all these operations to be in the source category. As evidence of this note that ''liquefied natural gas units'' are included in the list. These units, while part of the overall oil and natural gas industry, have never been contemplated as being part of the Crude Oil and Natural Gas source category.

2. ''Sufficiently Related'' Test and Whether Transmission and Storage Operations Are Distinct From Production and Processing

Comment: Commenters contend that the proposal to amend the source category definition is fundamentally at cross-purposes with the proposal to remove standards of performance for methane. The EPA proposed to justify the latter by finding that regulation of methane and VOC is redundant because the controls that sources are required to implement to reduce their VOC emissions will also reduce their methane emissions, and this is true regardless of the relative amounts of VOC and methane in their overall emissions. The commenters state that if methane regulation is redundant on those grounds, then differences in gas composition cannot be the basis for determining that two distinct source categories are necessary.

Response: The commenters conflate the proposal to remove the transmission and storage segment from the source category with the proposal to rescind the methane requirements for the remaining production and processing segment, without acknowledging that while the substance of each may have technical similarities, each proposal addresses discrete, stepwise legal aspects of CAA section 111(b). Under CAA section 111(b), a source category must first be listed before the EPA can promulgate an NSPS for sources within the category. The EPA proposed the first action of removing the transmission and storage segment from the source category, in part based on the conclusion that the segment was not previously properly added to the source category because there are distinct differences in operations and differences in the emissions profiles between the production and processing segments and the transmission and storage segment. As described further in this section, based on the sufficiently related test, these distinct differences in operations and differences in emissions profile means that the transmission and storage segment requires a separate SCF in order to be properly regulated under CAA section 111(b).

However, once a source category is properly listed and defined, as are the production and processing segments, the inquiry then is what are the appropriate standards of performance for sources within that category. This inquiry is separate from and subsequent to the initial inquiry of whether a source category is properly identified for regulation under CAA section 111(b). For example, the EPA has previously identified sources as appropriately subject to regulation under CAA section 111(b), but then subsequently declined to promulgate standards of performance based on inadequate data. In proposing VOC standards for equipment leaks in oil and gas processing, the EPA declined to apply such standards to equipment in the production segment, which is clearly part of the source category, because it did not have data on costs and emission reduction numbers at that time. 49 FR 2637.

Similarly, here, while the production and processing segments have been properly identified as subject to regulation under CAA section 111(b) through the 1979 listing of the source category, the EPA must then contend with *how* to regulate these segments. Accordingly, the EPA proposed the second action to rescind the methane requirements for the production and processing segments based on the fact that VOC and methane controls are redundant. While the rationales for both actions are premised partly on differences in gas composition, the legal and technical inquiry for each action is different, as these are discrete steps to regulation under CAA section 111(b). Though the findings under each inquiry are similarly premised on differences in gas composition, that does not mean that the response to both inquiries must be the same, as each inquiry is distinctly different from one another (*i.e.,* one is whether the transmission and storage segment is properly part of the source category, the other is whether and how to regulate methane from the production and processing segments). The rationale for this second action was also discussed at length in section IV.D of the 2019 Proposal (84 FR 50259 and 50260). The comments received and the EPA responses on this second action are provided in section VIII.B below.

Comment: Commenters do not agree that the transmission and storage segment cannot be included in the Crude Oil and Natural Gas source category because the gas composition and operations in that segment are too different from those in the production and processing segments. These commenters assert that the EPA's own data do not support the EPA's rationale. The commenters suggest that, while the EPA compares the average composition of the production segment to the average composition of the transmission segment, the Agency fails to consider the extensive overlap in the range of compositions in both segments. The commenters state that the EPA's 2011 Natural Gas Composition memorandum data show the wide range of compositions of gas in the production and transmission segments.[65] The commenters contend that the range of methane compositions in the production segment fully encompasses the range in the transmission segment, demonstrating the similarity of the gas composition in the two segments; similarly, there is extensive overlap between the segments' VOC compositions.

Commenters also discussed the EPA's more recent 2018 composition data,[66] asserting that it shows even more variation in gas composition. A commenter asserts that while the EPA recognizes that variations in the gas composition can occur from basin-to-basin within each segment, the EPA does not acknowledge that these basin-to-basin variations can swamp the purported variations on which the EPA relies to justify a distinction between production and transmission segments.

One commenter states that its experience with the oil and natural gas industry operating in Pennsylvania shows that unprocessed field gas [67] can range from, by volume, 75-percent to 98-percent methane and 0.1-percent to 10-percent VOC. The commenter states that in a number of Pennsylvania counties, the county average field gas composition meets the EPA's pipeline quality gas composition (*i.e.,* is equal to or greater than 93-percent methane and less than or equal to 1-percent VOC; HAP data is unavailable). The commenter states that there are several natural gas well pads that dehydrate the produced gas onsite and transfer custody directly to an interstate pipeline. The commenter notes that this reality further blurs the distinction between the production and the transmission and storage segments. The commenter contends that, if a well site is required to meet the requirements of the 2016 Rule, it stands to reason that a transmission compressor station accepting the same gas should be required to meet the same requirements.

One of the commenters also notes that the 2018 Natural Gas Composition memorandum did not include any updated data for the transmission and storage segment. The commenter states that, given the significant difference in the production segment data from 2011 and 2018, the EPA must collect more current data for the transmission and storage segment if it seeks to justify any claims about the segment being sufficiently distinct from production and processing to warrant revision of the source category.

Response: The EPA recognizes that the composition of natural gas in the production segment can vary considerably, and that in some basins/areas it is possible that the composition can mirror that in the transmission segment. However, while the commenters stress this overlap in the gas composition in limited geographical regions in the U.S., such as in some parts of Pennsylvania, they seem to discount the substantial differences in most areas. For example, for Texas, the EPA's 2011 gas composition analysis showed that the methane content in the production segment was, on average, 80.1 percent, but ranged from 55.0 percent to 97.8 percent.[68] Because the NSPS subpart OOOOa is a nationwide regulation which applies equally across the country, it is most appropriate to consider the average composition for the segments. Further, on a nationwide basis, the data clearly reveal a distinction in the gas composition between the production and processing segments and the transmission and storage segment.

The commenter is correct that the 2018 Natural Gas Composition memorandum did not include data for the transmission and storage segment. The EPA conducted a new analysis which analyzed average methane concentrations using 2015 through 2018 data reported under 40 CFR part 98, subpart W (Petroleum and Natural Gas Systems), of the EPA's GHGRP.[69] This analysis did include recent data for the transmission and storage segment. The EPA found that there is a statistically significant difference between the average methane concentration in natural gas at either the gas production, gathering and boosting, or gas processing [70] industry segments and the average methane concentration in natural gas at either the transmission compression or underground storage segment. This difference further supports the EPA's justification to remove the transmission and storage segment from this source category.

Comment: Several commenters disagree with the EPA's statements in the 2019 Proposal that equipment and operations in the production and processing segments were not interrelated with the transmission and storage facilities. The commenters contend that while the transmission and storage segment serves a different role than the production, processing, and distribution segments, it is still part of the overall oil and natural gas industry and is a necessary element of the source category because it prepares the recovered gas for distribution. They add that, as the 2019 Proposal notes, the processes used to remove impurities (for example, dehydrators) in the production and processing segments are also used in the transmission and storage segment (citing 84 FR 50258). Commenters noted that the 2016 Rule stated that the equipment and operations at production, processing, transmission, and storage facilities are a sequence of functions that are interrelated and necessary for getting the product ready for distribution (citing 81 FR 35838). Commenters also noted that the 2016 Rule also cited the increase in natural gas production from hydraulic fracturing and horizontal drilling as an example of the interrelated nature of the industry—*i.e.,* increased production resulting in an increase in the amount of natural gas needing to be processed and moved to market or stored, which in turn results in increases in emissions across the entire natural gas industry.

Response: The EPA agrees with the commenters that production, processing, transmission and storage are all segments of the oil and natural gas industry and that the transmission and storage segment is a part of the industry because it prepares the recovered gas for distribution.

However, this does not necessitate that all of the segments belong in the same source category for regulatory purposes under CAA section 111. As explained in the 2019 Proposal, the primary purposes of each segment differs. The purposes of the production and processing segments are to explore, drill, extract, and process crude oil and natural gas found beneath the earth's surface. Extracting crude oil and field gas through drilling wells and processing these products for distribution to petroleum refineries and gas pipelines is an industrial process that is distinct from the transmission and storage segment, whose primary purpose is to move to market pipeline quality natural gas through transmission

[65] Memorandum to Bruce Moore, U.S. EPA from Heather Brown, EC/R. ''Composition of Natural Gas for use in the Oil and Natural Gas Sector Rulemaking.'' July 2011. Docket ID Item No. EPA–HQ–OAR–2010–0505–0084.

[66] Memorandum to U.S. EPA from Eastern Research Group. ''Natural Gas Composition.'' November 13, 2018. Docket ID No. EPA–HQ–OAR–2017–0757.

[67] Field gas is described earlier in section V.B of this preamble.

[68] Memorandum to Bruce Moore, U.S. EPA from Heather Brown, EC/R. ''Composition of Natural Gas for use in the Oil and Natural Gas Sector Rulemaking.'' July 2011. Docket ID Item No. EPA–HQ–OAR–2010–0505–0084.

[69] Analysis of Average Methane Concentrations in the Petroleum and Natural Gas Industry Using Data Reported Under 40 CFR part 98 Subpart W. April 6, 2020. Included in Docket ID No. EPA–HQ–OAR–2017–0757.

[70] Methane concentrations at gas processing facilities evaluated in this study are based on the inlet gas composition (as received) by the gas processing facilities.

pipelines by increasing the pressure and to store the gas underground along the pipeline.

The EPA understands that dehydrators are used to remove impurities from the natural gas in both the production and processing segments and in the transmission and storage segment. In the latter segment, dehydrators are occasionally present along transmission pipelines and at natural gas storage facilities to remove water and other impurities that condense as a result of temperature and pressure changes as the gas moves through the pipeline or is stored underground. However, the different uses of dehydrators illustrate the separate functions that the segments have in the industry. In the transmission and storage segment, dehydrators simply remove these impurities as they accumulate in pipelines. In the production and processing segment, dehydrators are a part of the process to change the overall composition of the gas. It is also noteworthy that the EPA included and regulated air toxics emissions from dehydrators in two separate source categories and in two different NESHAP. Dehydrators in the production and processing segments are covered by 40 CFR part 63, subpart HH, and dehydrators in the natural gas transmission and storage segment are covered by 40 CFR part 63, subpart HHH.

The EPA continues to assert that the comparison with the petroleum industry is directly relevant. The commenters insist that the necessary link between the extraction and processing of the natural gas in the production and processing segments and the transmission of the natural gas predetermines that the two segments must be treated as a single source category. However, this same link exists between the extraction and processing of oil, condensate (and other liquids from oil and natural gas wells) in the production segment and the petroleum refineries and pipelines that refine/process and distribute these liquids. However, the commenters do not suggest the interrelatedness of the production and processing sources originally included in the Crude Oil and Natural Gas Production source category with those in the petroleum liquid source categories necessitates that Crude Oil and Natural Gas Production and Petroleum Refineries be combined into one category and regulated together. The EPA applies the same logic to conclude that the fact that the transmission and storage segment is related to the production and processing sources in the Crude Oil and Natural Gas Production source category does not necessarily result in the requirement that they be regulated together. In addition, other instances in which similar source types emitting the same air pollutants and subject to the same types of controls are included in different source categories. For example, leaking pumps, valves, connectors, and other components at a wide variety of types of facilities that emit VOC and GHG are included in different source categories.

3. The Authority To Expand Source Categories and the EPA's Alternative Approach

Comment: One commenter asserts that, while the 2012 Rule and 2016 Rule expanded the source category, this expansion was appropriate considering the statutory mandate that the Administrator should from time to time review the source categories. The commenter states that the purpose of this review was to assure that the EPA periodically consider new scientific developments to ensure that the Agency was continually acting in a way that protected the public health. The commenter adds that the statute provides no guidance regarding the proper scope of a source category, and that Congress left that determination to Agency expertise, so long as the Agency considers the impacts of the source's emissions on public health. According to the commenter, the EPA's expansion of the source category in the 2016 Rule properly considered the source category's impact on the public health. However, the commenter adds, but the EPA's current effort to rescind that expansion is based on alleged procedural errors and fails to consider the public health impacts of the transmission and storage segment. The commenter states that the transmission and storage segment does significantly contribute to the deterioration of public health. The commenter asserts that the natural gas held at storage facilities contains all of the same toxic air pollutants and hazardous chemicals as natural gas does at other stages of the production process, and that the methane and VOC emissions from compressor stations have the same adverse impact on public health regardless of what segment of the source category the methane and VOC emissions are coming from. The commenter suggests that the EPA take this opportunity to do its own analysis to determine whether methane, VOC, and HAP (air toxic) emissions from the transmission and storage segment of the source category adversely impact public health.

Response: The EPA agrees that the CAA authorizes the EPA to review and revise source categories, and that its purpose was to ensure that the Agency was continually acting in a way that protected the public health. However, the EPA disagrees with the commenters' position on the EPA's past consideration of public health in the expansion of the Crude Oil and Natural Gas source category. The EPA's 2015 evaluation of the impacts of GHG, VOC, and SO_2 on public health and welfare (80 FR 56601) was conducted for crude oil and natural gas production and processing, along with natural gas transmission and storage. While it is true, as the commenter points out, that methane and VOC are emitted from the natural gas transmission and storage segment, the EPA's 2015 analysis did not separate the impacts of the pollutants emitted by natural gas transmission and storage to demonstrate that the emissions from this segment contribute significantly to the overall impacts. In the 2019 Proposal, the EPA proposed that it was required to make a finding that the transmission and storage segment, in and of itself, contributes significantly to air pollution which may reasonably be anticipated to endanger public health and welfare. Nothing in the comments provided cause the EPA to change this conclusion.

4. Significant Contribution Finding for Natural Gas Transmission and Storage

Comment: Several commenters state that the SCF that the EPA made in the 2016 Rule, which was for the production, processing, transportation, and storage segments collectively, was not appropriate to authorize the EPA to promulgate NSPS for sources in the transmission and storage segment. The commenters assert that to regulate sources in that segment, the EPA was required to make a SCF determination for emissions from that segment itself. Commenters explain that, to consider otherwise, once the EPA makes a SCF determination for a source category consisting of certain types of sources, the Agency would then be able to add into that source category all manner of ancillary equipment and operations, even if those ancillary equipment and operations do not in and of themselves significantly contribute to the previously-identified endangerment. The commenter states that this would allow the EPA to evade the express listing criteria by lumping loose associations of nominally related segments of an industry into a sector.

Other commenters disagreed, stating that in the 2016 Rule, the EPA determined that the rulemaking record supported a revision of the source category listing to include broadly the entire oil and natural gas industry (*i.e.,* production, processing, transmission and storage) that, in the Administrator's judgment, contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. Commenters add that CAA section 111(b)(1)(A) grants the Administrator authority to ''from time to time . . . revise'' the listed categories, and that nothing in the statutory text or relevant case law suggests that the EPA must, before revising a source category in a way that expands its scope, make a SCF determination for the newly added part of the category, considered alone. The commenter adds that nothing in the statute indicates that Congress intended for it to be more difficult for the EPA to add sources to a category than to include those sources in the category in the first instance. The commenter states that the EPA's obligation when revising a source category is only to conclude that the entire category, as revised, can still be deemed to contribute significantly to pollution that endangers public health or welfare.

Response: In this action, the EPA is determining that the transmission and storage segment of the oil and natural gas industry should not be included with the production and processing segments as a single source category. For that reason, if, in the future, the EPA seeks to promulgate standards of performance for any air pollutants from the transmission and storage segment, it must first list the segment as a source category and then determine that their emissions cause or contribute significantly to air pollution reasonably anticipated to endanger public health or welfare (SCF). Commenters take different positions on the question of whether the EPA must make a SCF for the transmission and storage segment as a predicate to adding them into a source category that already includes the production and processing segments. However, because the EPA is determining that the transmission and storage segment was not properly added to the source category, it is not necessary to resolve that question, and the EPA does not do so in this action.

Comment: Several commenters assert that, in order to remove transmission and storage segment sources from the Oil and Natural Gas source category, the EPA must affirmatively show that emissions from the sources do not significantly impact public health.

Response: The EPA disagrees with this comment. In this action, the EPA is determining that its previous determinations that the Crude Oil and Natural Gas source category included the transmission and storage segment beginning in 1979, or, in the alternative, that the EPA was justified in expanding the category to include that segment, were improper. Rather, the EPA is determining that the source category did not include that segment beginning in 1979 and that the EPA's action in 2012 and 2016 to add this segment into the source category was improper. These reasons justify the EPA in determining that the proper scope of the source category is the production and processing segments alone. There is no requirement under CAA section 111 that the improperly added segment must remain in the source category until the EPA determines that they do not cause or contribute significantly to dangerous air pollution.

5. Whether EPA Must Move To Add/Expand the Source Category and Regulate Transmission and Storage Emission Sources

Comment: Several commenters suggest that if the EPA finalizes the proposal to remove natural gas transmission and storage and rescind the applicable requirements for this segment, that the EPA should also move to properly and legally expand the source category and regulate natural gas transmission and storage emission sources. The commenters state that, beyond asserting that it might do so in the future, the proposal fails to explain why it does not take the logical next step and assess whether the emissions from the transmission and storage segment contribute significantly to dangerous pollution. The commenters contend that the current record, as well as the EPA's past findings, demonstrates that the emissions from the transmission and storage segment by itself does contribute significantly to dangerous air pollution.

Response: The EPA determined that the Agency's past interpretations and actions related to the inclusion of the transmission and storage segment in the Crude Oil and Natural Gas Production source category were in error. This action focuses on the correction of these past errors and interpretations. The EPA posits that retaining this focus, in the absence of established SCF criteria for GHG emissions/methane needed to add/expand the scope of this rulemaking, is necessary and appropriate, and that doing so provides greater clarity and certainty for the regulated community.

The EPA agrees with commenters that if an appropriate assessment of the emissions from the transmission and storage segment concludes that emissions from this segment contribute significantly to the endangerment to public health or welfare, we would need to propose a separate rulemaking for the regulation of emissions from sources in this segment. However, the EPA is not, at this time, assessing whether the emissions from the transmission and storage segment contribute significantly to the endangerment to public health or welfare.

Further, the proposal preamble solicited comment regarding appropriate criteria for the EPA to consider in making a SCF. This request was made both as a broad matter and with particular reference to GHG emissions generally, and to methane emissions from the Oil and Natural Gas source category most particularly. The EPA is evaluating the responses received to its solicitation and has not yet established criteria that it would follow to make such a SCF for the transmission and storage segment as it relates to GHG emissions/methane. Discussion on comments received on the EPA's solicitation related to SCF criteria can be found in section VI.C of this preamble.

B. Rescission of the Applicability to Methane of the NSPS for Production and Processing Segments

The following summarizes some of the major comments on the EPA's proposal to rescind the methane NSPS for the production and processing segments and provides the EPA's responses. Additional discussion and comments and responses on this topic are provided above, in section V.B, and in Chapter 6 of the Response to Comments Document.

Comment: Several commenters do not agree with the proposal that section 111 of the CAA authorizes the EPA to rescind one pollutant's standards because another pollutant's standards may capture them. The EPA claims that it lacked a rational basis for its 2016 action because the requirements added in 2016 are entirely redundant with the existing NSPS for VOC. However, commenters indicate that there is not a specific provision within the CAA that expressly exempts pollutants from regulation due to overlapping control technology.

Response: Although it is true that no CAA provision explicitly authorizes rescinding requirements on the ground that they are redundant, the EPA's basis for this action is that it erred in the 2016 Rule when it concluded that it had a rational basis to regulate methane. It is not rational to impose redundant requirements, because they are not necessary and do not achieve additional health or environmental protections. This basis for the EPA's action does not depend on explicit statutory authorization.

Comment: Multiple commenters support removing methane requirements for the production and processing segments on the ground that they are redundant with the existing NSPS for VOC, for the reasons the EPA stated in the 2019 subparts OOOO and OOOOa Proposal. Another commenter states that: (1) Methane can be detected more economically than VOC and detecting VOC typically is 2 to 4 times the cost of detecting methane, (2) methane is a reliable indicator of VOC, and (3) detecting methane is safer than detecting VOC. Other commenters disagreed. One commenter states that, while the release of VOC may always be accompanied by methane, it does not follow that the release of methane will always be accompanied by the release of VOC. Some commenters make the case that the NSPS does not simply duplicate requirements for emission controls; rather, it allows, but does not require, operators to comply with both VOC and methane controls using the same practices. Another commenter states that selective technologies do exist and could be applied to reduce VOC but not methane emissions if the methane rescission is finalized. One commenter asserts that it would be arbitrary to regulate methane and VOC as the same just because the currently chosen control technologies are the same. Another commenter adds that, while the sources of VOC and methane leaks may overlap, the two have distinct pollutant effects. The commenter further adds that the urgency and stringency of desired reductions may differ considerably for the two pollutant categories and may change over time, if, for example, the need for climate change mitigation becomes more acute. The commenter suggests that the most sensible approach to regulation of emissions from oil and natural gas operations is, thus, to keep performance standards for both VOC and methane on the books, and to update those standards periodically as the science and technology evolve.

Response: The EPA acknowledges the comments but emphasizes that all of the requirements in the rule apply independently of emissions of either methane or VOC. We discussed this redundancy in detail in section IV.D of the 2019 Proposal (84 FR 50259) and in section V.B of this preamble. The EPA continues to take the position that standards of performance for methane emissions from the production and processing segments are redundant with the existing NSPS for VOC and establish no additional health protections. As explained, every affected source in the production and processing segments will continue to be subject to the same NSPS requirements for VOC as before, and those requirements will have the same impact in reducing the source's methane emissions as before the removal of methane requirements. The EPA maintains that removing the methane NSPS, while retaining the VOC NSPS, will not affect the amount of methane reductions that those requirements will achieve.

One commenter claims that methane can be detected more economically and more safely than VOC. First, it is important to note that BSER for leaking equipment is based on the use of OGI equipment, which does not require the direct measurement of VOC. It is also worthy to note that this commenter was primarily referring to economic and safety advantages of methane leak detection technologies deployed via aircraft, which is not an option currently allowed under the rule.

Comment: One commenter asserts that removing methane standards would almost certainly lead to the adoption of less protective requirements. The commenter notes that in the 2016 Response to Comment Document (p. 2–61), the EPA stated, ''that direct regulation of GHG enables the reduction of additional methane emissions beyond what could be achieved by prior VOC-focused rules.''

Response: The EPA agrees that, in theory, the direct regulation of GHG and consideration of the costs in relation to GHG reduction could result in more stringent standards and more emission reductions than if decisions were made entirely based on VOC emission reductions. The EPA also acknowledges that, for the 2016 Rule, the costs were considered both in relation to the VOC and methane emission reductions. However, the EPA disagrees with the comment that removing methane standards would ''almost certainly'' lead to less protective standards. A separate action amending NSPS subpart OOOOa (EPA–HQ–OAR–2017–0483; FRL–10013–60–OAR; FR Doc. 2020–18115), which will be finalized in the **Federal Register** of Tuesday, September 15, 2020, is an example of how this assertion by the commenter is incorrect.

In 2018, the EPA proposed amendments and clarifications to NSPS subpart OOOOa (83 FR 52056, October 15, 2018) as a result of the reconsideration of issues raised in petitions on the 2016 Rule. In 2018, the EPA proposed to decrease the monitoring frequency for well sites with average combined oil and natural gas production for the wells at the site greater than or equal to 15 barrels of oil equivalent (boe) per day from semi-annually to annually. The EPA also proposed to decrease the monitoring frequency at compressor stations from quarterly to semi-annually. For both of these situations, the standards were both for VOC and methane and the cost-effectiveness based on both VOC and methane emission reductions considered. In fact, the ''multi-pollutant'' cost effectiveness was also considered where the control costs were split between VOC and methane.

In a separate action, the EPA is finalizing the reconsideration amendments to NSPS subpart OOOOa (EPA–HQ–OAR–2017–0483; FRL–10013–60–OAR; FR Doc. 2020–18115). However, the decisions for these reconsideration amendments take into account this final policy review action, which first rescinds the methane standards for production and processing sources. Therefore, the separate reconsideration amendments are finalizing ''VOC-only'' standards based on the cost effectiveness of the reduction in VOC only. These final reconsideration amendments are more stringent than the proposed reconsideration amendments, which were based on both VOC and methane standards. Specifically, in the separate reconsideration action, the EPA is finalizing semi-annual monitoring for well sites with average combined oil and natural gas production for the wells at the site greater than or equal to 15 boe per day and semi-annual monitoring for gathering and boosting compressor stations. Therefore, in this specific situation, the elimination of methane standards resulted in more stringent standards.

Comment: Commenters state that the redundancy rationale does not consider future BSER evaluations required by CAA section 111(b)(1)(B). One commenter notes that CAA section 111(b)(1)(B) requires the EPA to periodically—every 8 years—review and, if appropriate, revise the standards established under this section (we refer to this as the 8-year review). Commenters state that removing methane will mean that the methane requirements will not be subject to this review. One commenter states that the EPA's claimed redundancy ignores that methane regulation will have unique impacts on the 8-year review, including how the Agency considers cost and benefits, which are relevant factors in the likely stringency of the standards the EPA ultimately adopts.

A commenter states that, while the BSER is largely the same for methane and VOC in the current NSPS, there is no guarantee that the BSER will not diverge for the two pollutants in the future. The commenter adds that at least one other GHG—CO_2—is emitted in significant quantities from this industry, and the EPA may determine in the future that it has a rational basis to regulate those emissions under CAA section 111(b). The commenter states that, in that case, the BSER for GHG may differ significantly from the BSER for VOC, since the former would encompass controls for methane and CO_2.

Some commenters remark specifically on the future of technologies for fugitive emission detection and the impact on redundancy. One commenter states that future developments in leak monitoring technology may be able to speciate emissions (*i.e.,* distinguish between methane and VOC), potentially allowing operators to comply with a VOC-only NSPS by controlling VOC while leaving methane emissions unabated. The commenter states that the EPA fails to consider the impact of these VOC-only technologies on future methane emissions in the absence of the current NSPS. Another commenter similarly notes that for newly developed technologies that have the potential to significantly reduce the cost of compliance for regulated entities, the mandates are not redundant. The commenter states that more than 20 percent of natural gas produced in the U.S. has little or no VOC content, making VOC an inherently poor measurement target compared to methane. The commenter adds that some emerging emissions detection technologies—such as spectroscopic sensors used for aerial and satellite surveillance—are more sensitive to methane than to VOC. The commenter adds that, by signaling that reduction of methane emissions is not a national priority, the EPA discourages the development and improvement of the best available controls for methane.

Response: The EPA acknowledges the comments made regarding potential future control technologies and how that could impact redundancy. However, methane and VOC emissions occur through the same emission points and processes, and the same currently available technologies and techniques minimize both pollutants from these emission sources. The EPA recognizes that new control technologies are under development, particularly for detecting fugitive emissions. These emerging technologies include technologies that would detect speciated fugitive emissions from oil and natural gas operations, and, in the 2019 Proposal, the EPA solicited comment on these technologies. 84 FR 50260. We received some information, but we consider it speculative and lacking in specific examples, so that we do not have enough information to evaluate these technologies at this time, much less how these technologies could impact future analyses. In short, the potential for developing future technology that will distinguish between methane and VOC emissions does not change our conclusion that methane requirements at present are redundant. If such technology does develop, the EPA could consider whether to revisit the issue of regulation of methane. By the same token, it is speculative that the 8-year review would result in different levels of controls if EPA were to consider methane emissions and requirements, along with VOC emissions and requirements. In any event, commenters on that review could raise the issue of whether methane should be controlled and whether doing so would result in more stringent VOC controls. With respect to the comment that some natural gas produced has little or no VOC content, the detection of a leak using OGI equipment is not dependent on the relative concentrations of VOC or methane, so that leaks of even low VOC gases would still be identified and required to be repaired. As discussed above, how the emergence of technology in the future could impact the requirements to detect and repair leaks is speculative at this point in time.

The EPA does not agree with the commenter that this action signals a reduction in the prioritization of the reduction in methane. As explained in section V.B.4 of this preamble and above in this section, the methane and VOC requirements are redundant, and the rescission of the methane requirements will streamline the regulation without impacting the methane reductions. With regard to discouraging the development of the best available controls for methane, future evaluations of BSER will continue to recognize the nationwide profile of natural gas, which includes VOC and methane. Therefore, improvements for the control of methane will be considered, as they also will represent improvements for VOC reductions.

Comment: One commenter expresses concern that although methane reductions would still occur even after the EPA rescinds the methane NSPS, the EPA has recently indicated its view that that reductions of co-emitted (but formally unregulated) pollutants should not factor into a benefits analysis in the same manner as those pollutants that are directly regulated. The commenter contends that, under this view, removing methane as a regulated pollutant could result in the Agency disregarding the benefits of methane emission reductions, which the EPA states are the only pollution reduction benefits from the oil and natural gas sector that the EPA can monetize (citing 81 FR 35827, June 3, 2016).

Response: The EPA maintains, as it did at proposal (84 FR 50278), that because the methane control options are redundant with VOC control options in the NSPS subpart OOOOa rule, there are no expected emission impacts or environmental disbenefits from rescinding the methane requirement for the production and processing segments. The EPA has made control decisions on the basis of the cost-effectiveness of the controls, for which monetization of health and environmental impacts other than emission reductions is not necessary. The decision whether to quantify and monetize health and environmental impacts is based upon technical judgments made within the context of developing RIAs which are written to satisfy Executive Order 12866 requirements. The EPA recognizes that in the current previous Oil and Natural Gas NSPS RIAs, the Agency has not quantified the benefits of reductions in emissions other than methane (except for quantifying the amounts of emissions reduced). These RIAs also explained these technical decisions. However, these choices have not influenced the choice of what pollutants to regulate, or the stringency of the standards promulgated, in the Oil and Natural Gas NSPS rulemakings.[71]

Comment: Several commenters state that the EPA fails to identify any way in which the alleged redundancy is problematic. The commenter notes that, while agencies may reconsider and revise their policies, before doing so they must demonstrate ''that the new policy is permissible under the statute, [and] that there are good reasons for it,'' taking into account the record of the previous rule (citing *Fox Television,* 556 U.S. at 515–16). The commenter states

[71] It should be noted that in its recently promulgated rule, ''National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units—Reconsideration of Supplemental Finding and Residual Risk and Technology Review'' (signed by the Administrator on April 16, 2020), *https://www.epa.gov/sites/production/files/2020-04/documents/frn_mats_finding_and_rtr_2060-at99_final_rule.pdf,* the EPA based its regulatory decision primarily on the amounts and costs of reductions of the regulated pollutant, but stated that it may continue to consider the co-benefits of reductions in other pollutants, as long as doing so is consistent with the applicable CAA provisions.

that the EPA has failed to provide any ''good reasons'' for why the alleged redundancy between methane and VOC requirements justifies the removal of methane requirements. The commenter explains that the EPA states in the 2019 Proposal that there are ''no expected cost . . . effects from removing the methane requirements . . .'' (citing 84 FR 50247). The commenter states that the EPA characterizes removal of methane requirements as ''less disruptive'' than removal of VOC requirements (citing 84 FR 50260), but does not explain why it is taking any ''disruptive'' action at all, especially since the 2016 Rule has been in full effect and successfully implemented for over 3 years.

Response: The fact that the air pollution controls implemented by sources in the Crude Oil and Natural Gas Production source category to comply with the VOC NSPS reduce methane emissions along with VOC emissions means that the legal requirement to control methane—that is, the methane NSPS—is redundant to the VOC requirement, and, therefore, is unnecessary. The fact that the methane NSPS does not provide benefits—it does not reduce emissions beyond what would otherwise occur—means that the EPA erred in the 2016 Rule when it determined that it had a rational basis to promulgate the methane NSPS, which is sufficient justification to rescind that regulation. As discussed elsewhere, as a predicate for promulgating NSPS for methane, the EPA was required to, and failed, to make a SCF for methane emissions from the appropriately constituted source category.

Comment: One commenter states that the EPA's true rationale for rescinding the methane NSPS is to prevent regulation of existing sources under CAA section 111(d). The commenter notes that the courts have held that administrative agencies must identify their actual reasons for policy choices, that an agency's decision may be arbitrary or pretextual if there is a substantial mismatch between the action and the rationale, and that the courts will compare the evidence for the Agency's decision with the stated explanation to discern whether such a mismatch is present (citing *Dep't of Commerce* v. *New York,* 139 S.Ct. 2551, 2575 (2019)). Noting that CAA section 111(d) imposes, as a precondition to regulation of GHG from existing sources, promulgation of NSPS for GHG under CAA section 111(b), the commenter asserts that in this case, the Agency's true rationale for rescinding the methane NSPS is to prevent regulation of methane emissions from existing oil and natural gas sources under CAA section 111(d). The commenter reviews email communications between oil and natural gas industry officials and EPA (including transition team) officials related to the Agency's decision in early 2017 to rescind the Information Collection Request (ICR) under CAA section 114 for information from existing oil and natural gas sources concerning their methane emissions, coupled with the rescission of that ICR, as evidence of what the commenter considers to be the Agency's true rationale. The commenter asserts that the Agency's stated rationale of redundancy is arbitrary and pretextual.

Response: The EPA disagrees with the commenter. The EPA's reasons for rescinding the methane NSPS are as stated in the 2019 NSPS subparts OOOO and OOOOa proposal, this preamble, and the accompanying documents: The methane NSPS is redundant to the VOC NSPS and does not achieve additional reductions. In other sections of this preamble and the supporting documents, the EPA elaborates upon this rationale and relies on it in responding to adverse comments. The Agency justified its rescission of the ICR in the rulemaking action in which it did so, and that action is separate from this rulemaking.

Comment: Several commenters address the issue of which set of NSPS to retain, methane or VOC. One commenter notes that by keeping the focus on VOC, the EPA ensures that storage tanks, which represent an important source of emissions in the production, gathering and boosting, and processing segments, remain regulated, whereas storage vessels would not be regulated under a methane-only rule. The commenter adds that the EPA data supporting NSPS subpart OOOO shows that, aside from completion activities, estimated VOC reductions from storage vessels represent the largest source of VOC reductions. *See* Regulatory Impact Analysis, April 2012 at Table 3–4. *See* 2019 Proposal, 50260 (''Some sources, such as storage vessels, are subject only to VOC requirements and not methane requirements.''). Other commenters asserted that, if redundancy is the concern for the EPA, the Agency should make methane the key pollutant and remove VOC from the requirements because this will allow for the regulation of existing sources of methane and VOC, and thereby result in reduced environmental, social, and health impacts from both pollutants.

Response: As noted in section V.B above, the EPA is rescinding the methane NSPS and retaining the VOC NSPS, rather than vice versa, because rescinding the latter would affect more facilities, and affect facilities that had been regulated for a longer period. The EPA does not agree that the methane standards should be retained instead of the VOC standards in order to retain the trigger of the CAA section 111(d) requirement to develop standards for existing sources standards. The purpose of the NSPS is to reduce emissions from new sources; as a result, the decision of which NSPS to retain should not turn on the impact on existing sources.

IX. Summary of Significant Comments and Responses on Significant Contribution Finding for Methane

This section summarizes and responds to comments on the 2019 Proposal's solicitation of comment on whether the EPA is required to make, or is authorized to make, a SCF for methane emissions from the Oil and Natural Gas Production source category as a predicate for promulgating methane NSPS.

A. Requirement for Pollutant-Specific Significant Contribution Finding

1. Promulgation of NSPS for Pollutants That the EPA Did Not Evaluate When It Listed the Source Category

Comment: Some commenters assert that CAA section 111 cannot be interpreted to authorize the EPA to promulgate NSPS for air pollutants that were not the subject of the EPA's initial determination that the source category causes or significantly contributes to dangerous air pollution. Commenters argue that in determining which pollutants the EPA should regulate from a source category under CAA section 111(b), it is reasonable to conclude that it should be limited to the pollutants that justified listing that source category for regulation in the first place. Commenters add that this interpretation provides for consistency in applying CAA section 111 across all air pollutants, that is, the EPA regulates air pollutants that it considered when it made a SCF determination for the source category, as well as air pollutants that it regulates subsequently, as long as it makes a similar SCF determination for those subsequently regulated air pollutants. A commenter adds that this approach makes sense because, to list the source category, the Agency must engage in some level of analysis to understand the nature of the emissions from that category; and that the Agency should apply the same analysis to air pollutants that it subsequently seeks to regulate. Numerous commenters state that it is anomalous for the EPA to attempt to regulate methane, as of 2016, based on a SCF determination the EPA made in 1977 and 1978, when methane was not even a regulated pollutant under the CAA.

Other commenters take the opposite view. One asserts that CAA section 111(b)(1) affords the EPA broad discretion to determine which pollutants and sources to regulate and allows the EPA to revise the NSPS to include pollutants or emission sources that were not currently regulated for a particular source category. Other commenters assert that, if the Agency failed to regulate a pollutant emitted from a listed category when it first issued standards for the source category, it must do so in a later rulemaking to achieve the purposes of the CAA, within the limitations set forth in CAA section 111. One commenter argues that CAA section 111(b)(1)(A)'s statutory factors for listing a source category provide a floor according to which the EPA must regulate a particular pollutant from that category, regardless of whether the pollutant is addressed in the initial listing decision.

Response: The EPA agrees that it promotes consistent treatment of all air pollutants subject to the NSPS to require a pollutant-specific SCF as a predicate for regulating a pollutant that the Agency did not consider at the time it made the SCF for the source category and promulgated the initial NSPS. The EPA further agrees that it is anomalous for the Agency to newly regulate an air pollutant, like methane, long after listing the source category on the basis of other pollutants, unless the Agency makes a determination concerning that pollutant that is comparable to the determination that it made when it listed the source category. These considerations support the Agency's interpretation, described in section VI above, that the Agency's authority to promulgate standards of performance for particular air pollutants under CAA section 111(b)(1)(B), along with the definition of ''standard of performance'' under CAA section 111(a)(1), must be interpreted within the context of the finding the Agency makes concerning the source category's contribution to dangerous air pollution under CAA section 111(b)(1)(A). For the same reasons, the Agency disagrees with commenters who assert that listing the source category is a sufficient predicate for subsequent regulation of air pollutants that the Agency did not address in that listing or in promulgating the initial set of standards of performance.

2. Congressional Intent

Comment: The EPA noted in the 2019 Proposal that during the 1977 CAA Amendments, the House-Senate Conference Committee Report described the revisions made to the SCF and endangerment requirements in CAA section 111 and other provisions as follows:

> Provides a uniform standard of proof for EPA regulation of air pollutants which applies to the setting of . . . criteria for national ambient air quality standards under Section 108; . . . new stationary source performance standards under Section 111; . . . new auto emission standards under Section 202; . . . regulations of fuels and fuel additives under Section 211; aircraft emission standards under Section 231.
>
> *In all future rulemaking in these areas, the Administrator could regulate any air pollutant from those sources, the emissions of which ''in his judgment cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare.''*

H.R. Rep. No. 95–564, at 183–84 (1977) (emphasis added) (cited in 84 FR 50264). The EPA stated in the 2019 Proposal that the emphasized language is evidence that Congress intended to require the EPA (or understood that the EPA had always been required), in promulgating a pollutant-specific NSPS under CAA section 111, to make a pollutant-specific finding, as the EPA does under the other provisions mentioned in the Conference Report. *Id.* at 50264–65.

The 2019 Proposal added that the House Committee Report for the 1977 CAA Amendments included a similar statement in describing one of its purposes for rephrasing the various endangerment finding provisions: ''To provide the same standard of proof for *regulation of any air pollutant, whether that pollutant comes from stationary or mobile sources, or both,* and to make the vehicle and fuel industries equally responsible for cleaning up vehicle exhaust emissions.'' H.R. Rep. No. 94–1175, at 33 (1976) (emphasis added) (cited in *Id.* at 50265). The EPA added that the emphasized phrase could suggest that the House Committee drafters understood the SCF provision in CAA section 111(b)(1)(A) to concern the particular air pollutant subject to the NSPS, like other analogous provisions. *Id.*

Commenters offered competing interpretations of these statements in the 1977 legislative history. Some commenters agreed with the EPA's discussion, noted above. Other commenters, however, state that those Committee Report statements do not support interpreting CAA section 111 to require a pollutant-specific SCF. They assert that the 2019 Proposal was incorrect in suggesting that the 1977 CAA Amendments imposed uniform requirements on the several CAA provisions calling for contribution and endangerment determinations; rather, the commenters noted, the precise terms Congress adopted varied for each of those provisions, the terms function differently for each of the provisions, and the language in the Conference Report was a paraphrase of those provisions. For example, one commenter noted, the statement in the Conference Report does not describe how the cause-or-contribute phrase that appears in section 108 works. The commenter explained that this phrase relates not the to ''the Administrator['s] . . . regulat[ion] [of an] air pollutant from [a] source[ ],'' but instead to the Administrator's decision as to which emissions to include on the list of NAAQS pollutants. The commenter states that the NAAQS program is an area-specific program, not a source-specific one, and it grants states, not the Administrator, the primary authority to directly control emissions to achieve the NAAQS. Other commenters state that the purpose of this language in the Conference Report was to explain that Congress revised the various SCF and endangerment provisions to assure that they were each precautionary, not to assure that they each required a pollutant-specific SCF. Another commenter notes that these revisions to the SCF and endangerment provisions were made to CAA section 111(b)(1)(A), which covers source category listings, but not to CAA section 111(b)(1)(B), which requires the EPA to promulgate standards of performance. The commenter asserts that, if Congress had wanted to make clear that the EPA may not issue standards under CAA section 111(b)(1)(B) unless it had made a pollutant-specific SCF, it could have achieved that result by amending CAA section 111(b)(1)(B) in addition to CAA section 111(b)(1)(A), but it chose not to do so. The commenter asserts that ''[w]hen Congress amends one statutory provision but not another, it is presumed to have acted intentionally'' (citing *Gross* v. *FBL Fin. Servs., Inc.,* 557 U.S. 167, 174 (2009)). Other commenters contend that the Conference Report is at best ambiguous as to whether the source or the air pollutant must be the focus of the ''cause or contribute'' finding, and, in any event, cannot overcome what they describe as the plain meaning of the statute.

Response: We appreciate the different perspectives that commenters provide on the above-quoted statements in the legislative history. Because these statements explicitly describe CAA section 111, along with other CAA provisions, as requiring a pollutant-specific SCF, we think that they can fairly be read to indicate that interpreting CAA section 111 to require, or at least authorize the Administrator to require, a pollutant-specific SCF is consistent with Congressional intent. It was not necessary for Congress to amend CAA section 111(b)(1)(B) explicitly to require a pollutant-specific SCF because its provisions, read in context, already required, or at least authorized the EPA to require, that SCF. None of the commenters point to anything in the legislative history that indicates Congress did not intend to require a pollutant-specific SCF under CAA section 111.

3. Comparison With Other CAA Provisions That Generally Include a Cause or Contribute Finding on a Pollutant-Specific Basis

In the 2019 Proposal, the EPA noted that when Congress enacted CAA section 111 as part of the 1970 CAA Amendments, Congress also enacted several other provisions that required the EPA to promulgate regulations for certain pollutants or certain sources, and that in each of these provisions, Congress required the EPA to make an endangerment or cause or contribute finding, and, further, required the EPA to make the relevant finding on a pollutant-specific basis. The EPA solicited comment on the relevance of whether any of these other provisions for whether CAA section 111 could be interpreted to require, or at least authorize, a pollutant-specific SCF. 84 FR 50263 and 64, 50265 n.74 (discussing, among others, CAA sections 108(a)(1)(A) and (B), 115(a), 202(a)(1), 211(c)(1), 231(a)(2)).

Comment: Some commenters stated that interpreting CAA section 111 to not require a pollutant-specific SCF renders that section anomalous compared with other CAA provisions that premise the EPA's regulatory authority on a pollutant-specific ''cause or contribute'' finding. One commenter suggests that the primary difference between CAA section 111(b) and certain other CAA provisions is that CAA section 111(b) requires that the source category cause or contribute ''significantly'' to air pollution endangering public health or welfare. The commenter states that this implies that the EPA should face a higher burden to justify regulating each specific pollutant under CAA section 111, not a lower burden that allows the EPA to regulate every pollutant from the source category so long as just one meets the statutory criteria.

Other commenters take the opposite position. They assert that the requirements for pollutant-specific cause-or-contribute findings under other CAA sections shows that Congress knew how to require pollutant-specific findings when it intended to do so, and it evidently did not intend to do so under CAA section 111. Another commenter adds that Congress clearly chose to use different phrasing in different sections because it amended all these provisions at the same time in the same section of the 1977 CAA Amendments. From this, the commenter infers that Congress chose to use different phrasing in CAA section 111 than in the other provisions.

One commenter distinguishes CAA section 111 from other CAA provisions that the EPA cited because the latter provisions identify the particular category or class of sources as requiring regulation, and the EPA proceeds to regulate particular pollutants from those sources that it determines cause or contribute to dangerous air pollution. The commenter states that these provisions include CAA section 183(f)(1)(A) (addressing standards applicable to the loading and unloading of tank vessels) and CAA section 213(a)(1) through (4) (governing emission standards for new nonroad engines and vehicles). In contrast, the commenter explains, CAA section 111 does not pre-define any source category for regulation, but instead directs the EPA to fulfill this obligation. The commenter asserts that it is implausible that Congress would rest on any implication from CAA section 111(b) that the EPA must make an additional SCF for each pollutant regulated. The commenter adds that Congress knew how to provide for such an additional finding because CAA section 213(a)(4) requires one for an air pollution problem that (1) emissions from new nonroad engines or vehicles contribute significantly to and (2) emissions from classes or categories of new nonroad engines or vehicles cause or contribute to.

The commenter also identifies another distinction between CAA section 111 and some of the other provisions the EPA cites, which is that the latter address a specific kind or sub-class of pollutants. For example, according to the commenter, CAA sections 108(a)(1)(A) and (B) charges the Administrator with determining which emissions should be classified as criteria pollutants subject to the NAAQS because they contribute to dangerous air pollution and are emitted by numerous diverse mobile or stationary sources, and CAA section 115(a) concerns specific instances in which a pollutant or pollutants that originated in the U.S. cross an international border and endanger public health or welfare in a foreign country. The commenter suggests that a pollutant-specific contribution finding is sensible for these programs: The Agency's task is to identify all the air pollutants that contribute to an air pollution problem in order to determine whether they should qualify as NAAQS pollutants or whether they are harming public health or welfare in another country. The commenter states that this approach is distinct from CAA section 111, which is oriented toward source categories and requires them to achieve an emission limitation that reflects deployment of the BSER for dangerous pollutants, and which does not focus on or even reference any particular type or sub-class of pollutants.

Response: The EPA appreciates the commenters' perspectives on whether the other provisions in the CAA that explicitly require a pollutant-specific contribution finding suggest that Congress did or did not intend that CAA section 111 do so as well. For the reasons described in section VI above, by their terms, CAA section 111(b)(1)(B), in conjunction with CAA section 111(a)(1), and in the context of CAA section 111(b)(1)(A), requires, or at least authorizes the EPA to require, a pollutant-specific SCF as a predicate to promulgating a NSPS for that pollutant, notwithstanding the fact that Congress did not explicitly require such a determination in CAA section 111(b)(1)(B). We believe that this interpretation is consistent with the fact that Congress included requirements for a pollutant-specific cause-or-contribute finding in other CAA provisions. It is true, as the EPA recognized in the 2019 Proposal, 84 FR 50264, and as commenters noted, these other provisions differ from CAA section 111(b) in certain respects, but they differ from each other as well. For example, in CAA sections 213(a)(2), (3), and (4), Congress required a two-step determination, unlike in other provisions. In addition, the fact that CAA section 111 delegates to the EPA the task of identifying the source category for regulation, whereas other provisions themselves identify the source category, explains why it is necessary for the EPA to make a SCF for the source category (it is to assure that the source category merits regulation), but does not provide a compelling reason why the EPA should not also, when it subsequently promulgates a NSPS for a particular pollutant, make a SCF for that pollutant. The important point from comparing these various provisions is that Congress recognized the utility of a pollutant-specific cause-or-contribute finding in a range of circumstances, including a range of regulatory schemes for a range of industries that emit a range of air pollutants that affect a range of geographic areas (including other nations, under CAA section 115). That supports interpreting CAA section 111 to include a pollutant-specific finding as well.

Comment: A commenter asserts that a two-step process in which the EPA makes a SCF for the source category and then for the particular pollutant is anomalous since the other provisions the EPA cites involve only a one-step process. The commenter adds that the two-step process is anomalous because the first step—listing the source category on grounds that it contributes significantly to dangerous air pollution—becomes unnecessary if the EPA must also determine that particular pollutants contribute significantly to dangerous air pollution. The commenter further suggests that a two-step scheme creates two additional anomalies: (1) The EPA might determine that emissions from a source category significantly contribute, but might not be able to determine that any individual air pollutant significantly contributes, and, therefore, might not be able to regulate at all; and (2) the EPA might determine that emissions from a source category significantly contributes, but might be able to regulate only an insignificant portion of those emissions. Another commenter asserts that the other provisions require only a cause-or-contribute finding, not a cause-or-contribute significantly finding, which casts doubt on the EPA's interpretation that CAA section 111(b) requires the latter type of finding.

Response: As noted above, CAA sections 213(a)(2), (3), and (4) impose a two-step process. The commenter's claimed anomalies may be theoretically possible but are highly unlikely to actually occur. The source categories that the EPA lists under CAA section 111(b)(1)(A) are industrial sources that the EPA has determined contribute significantly to dangerous air pollution and that typically emit more than one air pollutant; it is highly unlikely that none of such a category's air pollutants, or only a minor portion of its pollutants, would contribute significantly to dangerous air pollution, and the commenter does not claim that either of those situations is true of any of the some 76 source categories that the EPA has listed. As noted below, the rational-basis approach creates its own set of anomalies. Contrary to the commenter's views, a two-step process under CAA section 111(b)(1), under which the EPA makes a SCF for the source category and a SCF for the particular air pollutants, does not render the first step unnecessary. As the EPA explained in section VI above, the EPA has generally evaluated the contributions of the source category and the air pollutants it emits at the same time, and it has generally relied on data concerning the individual air pollutants to make the SCF for the source category. As a practical matter, then, the EPA generally would need to make a SCF for an air pollutant separately from the SCF for the source category only when the EPA seeks to promulgate a NSPS for an air pollutant that the EPA did not consider when it listed the source category. It is true, as the commenter noted, that the other provisions cited by the EPA in the 2019 Proposal and discussed by the commenters require a pollutant-specific cause-or-contribute finding, and not a SCF, but interpreting CAA section 111(b)(1)(B) to require, or at least authorize the EPA to require, a SCF is consistent with the requirement for a SCF under CAA section 111(b)(1)(A). Section 111(b)(1)(B) of the CAA is not unique in this regard—in the 1990 CAA Amendments, Congress revised the Good Neighbor Provision, CAA section 110(a)(2)(D)(i)(I), to require that SIPs prohibit sources from emitting air pollutants in amounts that will ''contribute significantly'' to nonattainment downwind.

4. Rational Basis Approach

Comment: Numerous commenters agree with, and elaborate on, the concerns that the EPA expressed in the 2019 Proposal about the rational basis approach (discussed in section VI of this preamble). Some note that the approach is not tied to any language in the CAA, is not based on any statutory criteria, and, thus, is largely undefined. They state that it does not meaningfully limit the EPA's authority and, therefore, injects confusion into the regulatory process. One commenter asserts that it makes no sense to regulate unless there is assurance that the regulation will produce the desired benefits, which may be accomplished only by analyzing emissions on a pollutant-specific basis. Other commenters add that the rational basis standard allows the EPA to rely on a SCF made for a source category decades ago for a different pollutant in order to justify regulating any pollutant from the category—even pollutants that do not cause or significantly contribute to endangerment. Many commenters assert that, without a pollutant-specific SCF, the EPA would have unfettered discretion to add pollutants no matter how minimal the contribution or how benign the impacts to public health and welfare, and that this could result in potentially costly, disruptive, and inefficient regulations on an industry. Another commenter points to anomalies that could result from the rational basis approach: (1) The approach could lead to a case where the EPA would be free to regulate all pollutants from a source category, even though only one of the pollutants was found to contribute to endangerment; and (2) it could result in disparate treatment of similarly emitting source categories: For example, Source Categories 1 and 2 may both emit Pollutant A in equal amounts that do not significantly contribute to endangerment, while Source Category 1 also emits Pollutant B in an amount that does significantly contribute to endangerment. The commenter states that, under the rational basis approach, the EPA would have the authority to list Source Category 1 and regulate emissions of Pollutant A from it, but would not have the authority to list Source Category 2, and, therefore, would not be able to regulate emissions of Pollutant A from it, even though each Source Category's emissions of Pollutant A present identically insignificant risks. The commenter contends that requiring a SCF for each pollutant would prevent these anomalies. In contrast to the vague rational basis standard, other commenters state, CAA section 111(b) provides clear criteria for whether the EPA is authorized to regulate a source's emissions of a pollutant: The endangerment and SCF determinations for listing a source category. Other commenters add that CAA section 111(b) established this rigorous finding as necessary to justify the EPA's authority to promulgate nationwide standards, and that only a pollutant-specific SCF, not a rational basis standard, would maintain that rigorous approach.

Other commenters assert that the requirement of a rational basis standard is appropriate. They note that the standard is equivalent to the ''arbitrary and capricious'' standard. They state that CAA section 111(b)(1)(A), by its terms, applies the endangerment and SCF findings to the source category as a whole, and not to each newly-regulated pollutant emitted from a previously-listed source category, and that, given that many decisions delegated to the EPA are governed by a default rational basis standard, it is reasonable to conclude that Congress could have intended that standard to govern the regulation of subsequent pollutants from previously-listed sources in the absence of any other prescription for how the EPA is to make the decision. Commenters further state that the arbitrary and capricious standard is not undefined. Rather, one commenter says, the Supreme Court, in defining ''[t]he scope of review under the 'arbitrary and capricious' standard,'' has explained that ''the agency must examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made'' (citing *Motor Vehicle Mfrs. Ass'n of U.S., Inc.* v. *State Farm Mut. Auto. Ins. Co.,* 463 U.S. 29, 42–43 (1983)). The commenter adds that the Court affirmed that it ''may not set aside an agency rule that is rational, based on consideration of the relevant factors and within the scope of the authority delegated to the agency by the statute.'' [72] The commenter adds that this standard applies whether or not Congress has expressly specified the criteria relevant to the Agency's decision. A commenter further notes that under the ''arbitrary and capricious'' standard, the Court has identified certain factors that the EPA must consider in promulgating emission standards under CAA section 111(b) (citing *Sierra Club* v. *Costle,* 657 F.2d 298, 326 (D.C. Cir. 1981). A commenter adds that the Court remanded the Lime Kiln NSPS under the ''arbitrary and capricious'' standard, and quoted from the legislative history of the 1977 Amendments, which indicated Congress's intent that the arbitrary and capricious standard to have teeth: ''With respect to the 'arbitrary and capricious' scope of review retained in these amendments, the conferees intend that the courts continue their thorough, comprehensive review which has characterized judicial proceedings under the CAA thus far'' (citing *Nat'l Lime Ass'n* v. *EPA,* 627 F.2d 416, 452 (D.C. Cir. 1980) (quoting H.R. Conf. Rep. No. 564, 95th Cong., 1st Sess. 178 (1977))). The commenters contend that, under the arbitrary and capricious standard, an EPA decision to promulgate a standard of performance for a benign or harmless substance would fail.

Response: In the 2019 Proposal, the EPA acknowledged that the rational basis test ''offers some protection against arbitrary or capricious decisions by the EPA.'' 84 FR 50263. However, CAA section 111 includes no explicit criteria to guide the application of such a test, and in the times that the EPA has used the test, the EPA has not attempted to articulate criteria or metrics to guide it, and rather, has relied on facts and circumstances. In those respects, the rational basis test is largely (or wholly) undefined and could potentially incorporate a wide range of considerations and lead to inconsistent results. This creates uncertainty for the regulated industry and other stakeholders over whether particular additional pollutants will be regulated or not. The EPA has concluded that the standard is not appropriate for determining the air pollutants for which it will promulgate standards of performance under CAA section 111(b)(1)(B) because of statutory context: CAA section 111(b)(1)(A) makes clear that before the EPA may regulate any air pollutants from major new sources, it must determine that the source category whose sources emit the air pollutants cause or contribute significantly to dangerous air pollution. This is a rigorous predicate for regulation. It is not consonant with this rigorous predicate for the Agency to proceed to regulate the individual air pollutants based only on a rational basis determination. Rather, requiring the Agency to make a SCF determination is consistent with CAA section 111(b)(1)(A). In addition, the SCF determination is better defined because it is focused directly on the extent of the air pollutant's impact on dangerous air pollution, and it provides a metric for assessing that extent: The air pollutant causes or contributes significantly to that air pollution. These metrics more clearly cabin the EPA's discretion.

5. Impacts on the CAA Section 111 Program if a Pollutant-Specific SCF Is Needed

Comment: Commenters state that for more than 4 decades the EPA has interpreted CAA section 111(b)(1) to require a SCF as a prerequisite only for the initial listing of a source category. Commenters contend that, if the EPA now contradicts its past practice and interpretation and undermines or repeals what they describe as the dozens of NSPS it has issued during that time, entities that are subject to new and existing source performance standards under CAA section 111, as well as for the states and local agencies that implement those standards, and other stakeholders, will face regulatory uncertainty and harm to their reliance interests. Commenters add that the EPA's reversal of precedent would also call into question the validity of state implementation plans that were based in part on the continued existence of regulation under CAA section 111(b), as well as the validity of state and Federal plans based on CAA section 111(d) guidelines, and conclude that health and welfare will suffer. Commenters express concern that the EPA fails to provide an analysis of the potential impacts on the overall CAA section 111 program if a pollutant-specific SCF is needed. Commenters assert the EPA should not alter what they describe as the EPA's longstanding interpretation that a pollutant-specific SCF is not needed without first completing a full analysis of impacts such a change would have on existing CAA section 111 rules and soliciting further public participation through a separate notice-and-comment rulemaking process. One commenter contends that, even if the EPA begins requiring a pollutant specific contribution finding, this should not affect the validity of previously, lawfully issued NSPS and CAA section 111(d) guidelines and state plans.

Response: The EPA has listed some 76 source categories and promulgated over 100 standards of performance for them. In the vast majority of cases, the EPA identified the pollutants of concern at the time that it listed the source category or when it promulgated the initial set of standards of performance contemporaneously with the listing or shortly thereafter. It is only in recent rulemakings concerning GHG that stakeholders have expressed concerns that the EPA had not considered GHG when listing the source category, and, thus, had not made determinations for GHG consistent with the determinations that the EPA made to justify regulation of other pollutants from the source categories. Accordingly, the EPA disagrees with commenters who are concerned that interpreting CAA section 111 to require a pollutant-specific SCF will undermine numerous NSPS, with adverse effects for other CAA control programs. In addition, the rational basis approach, under which the EPA promulgates a standard of performance for a pollutant upon determining that it has a rational basis for doing so, cannot be considered to be long-established. The EPA clearly articulated this standard for the first time to justify regulation of a previously unregulated

[72] By the same token, a commenter notes that the EPA explained the rational basis test in its response to comments on the 2016 Rule as follows: ''the EPA's use of the phrase 'rational basis' . . . explains how the agency's actions are supported by the record and is a reasonable exercise of the EPA's broad authority under section 111'' (citing the EPA's Response to Public Comments at 2–16, Docket ID Item No. EPA–HQ–OAR–2010–0505–7632 (May 2016).

air pollutant in the 2015 EGU GHG NSPS rule, and then again in the 2016 Rule. The EPA considers that the present rulemaking has provided a full opportunity for the public to respond to the solicitation of comment on the pollutant-specific SCF interpretation.

B. Significant Contribution Finding in 2016 Rule

1. 2016 SCF for Methane Emissions From the Oil and Natural Gas Source Category

Comment: Several commenters contend that oil and gas methane emissions are too small to be considered ''significant.'' These commenters cite as support that the contribution of oil and gas to total U.S. GHG emissions is only 3 percent, that U.S. methane emissions are only 7 percent of global methane emissions, that U.S. methane emissions are only 1 percent of global GHG emissions, and that estimated impacts of the 2016 Rule would be to reduce methane concentrations in 2100 by 0.12 percent and temperatures by less than a thousandth of a degree. Other commenters assert that, if a SCF for methane emissions from the Oil and Natural Gas source category were required under the statute, the EPA fully satisfied this obligation in the 2016 Rule. Several commenters assert that, even if the EPA eliminates the transmission and storage segment from the source category, the 2016 SCF remains appropriate and binding. A commenter notes in the 2019 Proposal the production and processing segments account for 1.8 percent of global methane and 0.3 percent of total global GHG and states this is equal to or greater than the total methane emissions from all but eight countries around the world. The commenter asserts that these totals are significant by any measure. One commenter states that because climate change is a global phenomenon, small percentage changes are relevant and addressing a large number of smaller sources will ultimately reduce the rate of climate change. The commenter adds that to solve a global problem, reductions of a fraction of a percent are substantial and important (citing 2016 Rule's Response to Comments Document, Docket ID Item No. EPA–HQ–OAR–2010–0505–7632). One commenter states that, if the production and processing segments were listed as an individual methane source, it would still be larger than every other source currently listed apart from enteric fermentation. One commenter notes that in light of methane's 20-year GWP of 87, methane from the domestic sources accounts for 9.3 percent of total U.S. GHG emissions and 1.2 percent of global GHG emissions. One commenter states that the transmission and storage segment emits 16.8 percent of the source category's total GHG emissions and it would be arbitrary and capricious for the EPA to undermine its 2016 SCF by removing from that source category facilities that emit only a minority of the pollutants.

Response: The EPA agrees with commenters that the 2016 Rule failed to provide a pollutant-specific SCF as a prerequisite to imposing NSPS regulations for methane emissions. The SCF determination made in the 2016 Rule was on the basis of methane emissions from the production, processing, transmission and storage segments. In this action, the EPA is removing the transmission and storage segment from the source category. The 2016 Rule did not assess whether methane emissions from the production and processing segments alone cause or contribute significantly to dangerous air pollution; thus, we find that the 2016 Rule's determination is not adequate. In addition, the EPA has yet to makes an appropriate determination that methane emissions from the Oil and Natural Gas Production source category cause or contribute significantly to dangerous air pollution. The EPA appreciates the commenters' views concerning the amounts and impacts of methane emissions from the transmission and storage segment, as well as the production and processing segments, but until the EPA itself reviews and assesses those amounts of emissions, it cannot make a determination as to whether methane emissions from the production and processing segments contribute significantly to dangerous air pollution.

2. Identification of the Standard for Determining Significance

Comment: Commenters responded to the EPA's solicitation of comment concerning whether, as a matter of law, under CAA section 111, the EPA is obligated to identify the standard by which it determines whether a source category's emissions contribute significantly, and whether, if not so obligated, the EPA nevertheless fails to engage in reasoned decision-making by not identifying that standard. Some commenters stated that the EPA must identify the standard by which it determines whether a source category's emissions ''contribute significantly.'' They asserted that, in order to not be arbitrary and capricious, an agency must articulate a reasonable explanation for the actions it takes, and that as a result, the EPA should establish what constitutes ''significant'' contribution for purposes of CAA section 111(b). They note that the EPA has done so for other programs that require a similar showing, such as CAA sections 110(a)(2)(D)(i), 189(e), and 213 (citing 76 FR 48208, 48236 and 37 (August 8, 2011) (Cross-State Air Pollution Rule)). Other commenters assert there is no indication that Congress intended that the EPA must establish such a standard before making a SCF and that the EPA has made SCFs for dozens of source categories over almost 50 years without having established such a standard. They added that in the past, the EPA has appropriately relied on a facts and circumstances analysis and that it would be irrational to adopt a standard or threshold because different air pollutants have different effects on health and/or welfare, as well as different geographic trajectories.

Response: The EPA appreciates these comments, as well as the additional ones noted in the Response to Comments Document. They will inform the Agency's future consideration of this issue. As explained above, the Agency has concluded that it must identify a standard for ''contribute significantly'' in order to make a SCF for a source category, to ensure not only that the public is on notice of the criteria that the Agency uses in making such determinations but also that the Agency itself is acting consistently in making such determinations. However, it is not necessary to resolve the specific content of this standard in this rulemaking because, as discussed above in section VI of this preamble, the EPA is rescinding the SCF for methane from the Oil and Natural Gas Production source category that the Agency made in the 2016 Rule, on the ground that the scope of the source category inappropriately included the transmission and storage segment.

C. Criteria for Making a Significant Contribution Finding Under CAA Section 111

Comment: Several commenters responded to the EPA's solicitation of comment regarding criteria for the EPA to consider in making a SCF. Some recommend that the EPA defer any action on SCF criteria and instead address this question in a future advance notice of proposed rulemaking, ICR, and/or proposed rulemaking. One commenter adds that deferring the issue would allow the EPA to focus on finalizing the core rulemaking and to streamline issues in any future legal challenge to a final rule. Some commenters discuss other contexts under the CAA in which the Agency has interpreted and applied similar language to governing the SCF determinations under CAA section 111(b)(1)(A). For example, these commenters discuss factors suggested by past EPA action under CAA sections 189(e) and 213(a)(2), (3), and (4). Some commenters suggest specific criteria that the EPA could consider, including, among others, consideration of the 1979 source category listing methodology, factors related to climate change, all factors relevant to a source category's contribution on a case-by-case basis, accumulation in the atmosphere of pollutants, projected future emissions, and consistency with the goal of protection of the Nation's air resources. We summarize these comments at greater length in the Response to Comments Document.

Response: The EPA acknowledges the commenters' statements. As pointed out in the proposal, the EPA does not intend for these comments to inform the finalization of this rule, but rather to inform the EPA's actions in future rules. Therefore, the EPA is not evaluating the merits of comments on these topics at this time. However, the Agency will look at the details provided in these comments when considering future action in making a SCF.

X. Summary of Significant Comments and Responses Concerning Implications for Regulation of Existing Sources

A. Existing Source Regulation Under CAA Section 111(d)

Comment: Several commenters agree with the statements in the 2019 Proposal that the EPA's rescission of the applicability of the NSPS to methane emissions for the sources in the Crude Oil and Natural Gas Production source category that are currently covered by the NSPS would have the consequence that the EPA would no longer be authorized to regulate existing sources of the same type in the source category under CAA section 111(d).

However, other commenters assert that the 2016 Rule regulation of methane from the oil and natural gas sector has already triggered a mandatory duty for the EPA to develop CAA section 111(d) EG for existing sources within that sector. They state that the EPA's 2009 endangerment finding for GHG emissions and its 2016 rational basis determination and pollutant-specific endangerment/SCF for methane emissions from the Oil and Natural Gas Production source category obligate the EPA to regulate such emissions not just from new sources under CAA section 111(b), but also from existing sources under CAA section 111(d).

Response: The EPA agrees that following promulgation of the methane NSPS in the 2016 Rule, the EPA was obligated to develop EG under CAA section 111(d) for existing sources of methane in the source category. However, that obligation ends with the rescission of those NSPS. Section 111(d)(1) of the CAA provides by its terms that the EPA is authorized to promulgate guidelines for regulation of any existing source ''to which a standard of performance under this section would apply if such existing source were a new source.'' Once the EPA has rescinded the methane NSPS, existing sources of methane would no longer be subject to such an NSPS if they were new sources. As a result, from the time of the rescission forward, the EPA would no longer have authority to promulgate guidelines to regulate those sources. Nothing in CAA section 111(d) indicates that once the EPA promulgates NSPS that trigger an obligation to regulate existing sources, that obligation remains in place even after the NSPS has been rescinded.

Comment: As discussed in the proposal preamble for this action, the EPA interprets CAA section 111(d) as not permitting a CAA section 111(d) existing source regulation to be developed as a result of the NSPS for VOC emissions from new sources in the Crude Oil and Natural Gas Production source category under CAA section 111(b). Specifically, the EPA stated that VOC do not qualify as the type of air pollutant that, if subjected to a standard of performance for new sources, would trigger the application of CAA section 111(d) the pollutants excluded from regulation under CAA section 111(d) include pollutants which have been included on the EPA's CAA section 108(a) list. VOC are not expressly listed on the EPA's CAA section 108(a) list, but they are precursors to ozone and PM, both of which are listed CAA section 108(a) pollutants. The definition of ''air pollutant'' in CAA section 302(g) expressly provides that the term ''air pollutant'' includes precursors to the formation of an air pollutant ''to the extent that the Administrator has identified such precursor or precursors for the particular purpose for which the term 'air pollutant' is used.'' Based on this ''particular purpose'' phrasing, it is appropriate to identify VOC as a listed CAA section 108(a) pollutant for the particular purpose of applying the CAA section 108(a) exclusion in CAA section 111(d) [hereinafter referred to as the EPA's ''VOC exclusion argument'']. 84 FR 50272. Comments provided on the proposal both agree and disagree with this interpretation. These comments are provided below.

Commenters that agree with the EPA's interpretation assert that the statute is clear that a source category cannot be subject to CAA section 111(d) emission standards for ''any pollutant . . . for which air quality criteria have . . . been issued or which is . . . included on a list published under'' CAA section 108(a). The commenters state that while VOC are not themselves directly on the list of criteria pollutants under CAA section 108, the EPA has designated them as precursors for ozone and PM, both of which are listed CAA section 108(a) criteria pollutants. The commenters add that the CAA defines ''air pollutant'' to include ''any precursors to the formation of any air pollutant, to the extent the Administrator has identified such precursor or precursors for the particular purpose for which the term 'air pollutant' is used,'' and because the ''particular purpose'' of the term ''air pollutant'' in CAA section 111(d) is to identify pollutants that are already subject to regulation under the NAAQS program, it is appropriate to conclude that VOC are one of the ''air pollutants'' covered by this exclusion.

Conversely, several other commenters disagree with the EPA's interpretation that CAA section 111(d) does not require that existing source regulation be developed as a result of the NSPS for VOC emissions from new sources in the Crude Oil and Natural Gas Production source category under CAA section 111(b). One commenter notes that the EPA first argues that VOC are ''regulated under the CAA's NAAQS/SIP program'' because they are precursors to listed pollutants ozone and PM, pointing to provisions of the CAA relating to requirements for ozone non-attainment areas that explicitly call for reductions in VOC emissions. The commenter asserts, however, that the statutory test for whether a pollutant is excluded is not whether it is ''regulated under'' CAA section 108 or CAA section 110, but rather the test is whether air quality criteria have been issued for the pollutant of concern, or the pollutant has been listed under CAA section 108. The commenter asserts that neither of these is true here for VOC, as the only pollutants for which air quality criteria have been issued or included on a list published under CAA section 108(a) are SO_2, PM_{10} and $PM_{2.5}$, CO, ozone, NO_X, and lead.

One commenter contends that the proposal VOC exclusion argument contradicts the Agency's own position in other regulations and notes that in 1996 the EPA finalized parallel rulemakings for new and existing municipal solid waste (MSW) landfills under CAA sections 111(b) and 111(d), respectively. The commenter states that pollutants deemed harmful to human health emitted from MSW landfills included methane, VOC, HAP, and odorous compounds, collectively termed ''landfill gas.'' The commenter notes that the EPA chose to use non-methane organic compounds (NMOC), which includes VOC, as a surrogate for landfill gas in its setting standards of performance and EG for new and existing MSW landfills under CAA sections 111(b) and 111(d). The EPA updated these regulations in 2016 (2016 Standard), with its new EG ''expected to significantly reduce emissions of LFG [landfill gas] and its components, which include methane, VOC, and hazardous air pollutants (HAP).'' The commenter states that the EPA noted that reducing methane had become more important since the prior 1996 rulemaking, which had focused on NMOC (including VOC) ''because NMOC contain[ed] the air pollutants that at that time were of most concern due to their adverse effects on public health and welfare.'' The commenter adds that, as such, the 2016 Standard was focused on ''reducing [both] the NMOC and methane components of LFG.'' The commenter provides that the EPA acknowledged VOC was a precursor to criteria pollutants $PM_{2.5}$ and ozone, but nowhere did the EPA make the argument the Agency now raises that VOC status as a precursor means that it is not subject to regulation under CAA section 111(d).

Response: First, with respect to the comment that the EPA has applied a ''regulated under CAA 108'' test rather than the ''listed under CAA 108'' test that is stated in the statute, this comment misstates the EPA's argument. The EPA's conclusion is that VOC are included within the CAA section 108(a) listings for ozone and $PM_{2.5}$ for the particular purpose of applying the CAA section 108(a) exclusion in CAA section 111(d). The ''regulated under CAA 108'' point is one of the reasons why the EPA has concluded that it is appropriate to consider VOC to be part of the CAA section 108(a) listings for ozone and PM 2.5 for this purpose—because VOC are regulated through the NAAQS implementation program, and thus there is no gap in the CAA regulation of VOC that needs to be covered by CAA 111(d) regulation. In other words, we are not concluding that VOC are excluded from CAA 111(d) regulation because they are regulated under the NAAQS implementation program. Instead, we are concluding that VOC are excluded from 111(d) regulation because they are part of the CAA 108(a) listings for ozone and $PM_{2.5}$ for the purpose of applying CAA section 111(d), and we reach that conclusion based in part on the fact that VOC are regulated through the NAAQS implementation program.

Second, the argument that EPA's regulation of municipal solid waste (MSW) landfill emissions (sometimes referred to as ''landfill gas'') under CAA 111(d) contradicts EPA's conclusion that VOC cannot be regulated under CAA 111(d), because MSW landfill emissions landfill includes VOC among its components, is incorrect. The EG and standards of performance for MSW landfills that were originally promulgated in subparts Cc and WWW of part 60 and subsequently in subparts Cf and XXX regulate only ''MSW landfill emissions,'' not the individual components of landfill gases. *See* 40 CFR 60.30c through 60.36c; 40 CFR 60.30f through 60.41f; 40 CFR 60.750 through 60.759, and 40 CFR 60.760 through 60.769. Both the regulatory text in these subparts and the EPA's preamble discussion explicitly address this issue and clarify that ''MSW landfill emissions'' is a single designated pollutant and the only pollutant subject to regulation by these subparts.

For example, the regulatory text of 40 CFR part 60, subpart Cc, clarified that it contains guidelines for the control of ''certain designated pollutants'' and identifies ''MSW landfill emissions'' as the pollutant to be controlled by the state plans. 40 CFR 60.30c and 60.33c(a). The same is true for 40 CFR part 60, subpart Cf. 40 CFR 60.30f (subpart establishes requirements for ''designated pollutants), 60.33f(a) (pollutant to be controlled is ''MSW landfill emissions''). Similarly, 40 CFR part 60, subparts WWW and XXX, require affected sources to collect and control landfill gases, and each defines ''MSW landfill emissions'' as ''gas generated by the decomposition of organic waste deposited in an MSW landfill or derived from the evolution of organic compounds in the waste.'' 40 CFR 60.751; 40 CFR 60.761. This definition in each subpart makes clear that the regulated pollutant is confined to emissions that originate from an MSW landfill.

Further, in proposing the MSW regulations in 1991, the EPA was explicit that it was regulating only MSW landfill emissions collectively, and not the individual components of those emissions. The EPA stated the following in the preamble to the proposed rule:

> The pollutant to be regulated under the proposed standards and guidelines is ''MSW landfill emissions.'' Municipal solid waste landfill emissions, also commonly referred to as ''landfill gas,'' is a collection of air pollutants, including methane and NMOC's [non-methane organic compounds], some of which are toxic. The composite pollutant is proposed to be regulated under section 111(b), for new facilities, and is proposed to be the designated pollutant under section 111(d), for existing facilities.

56 FR 24468, 24470 (May 30, 1991). In additional discussion, the EPA explained the following:

> The EPA views these emissions as a complex aggregate of pollutants which together pose a threat to public health and welfare based on the combined adverse effects of the various components. . . . [T]he exact composition of MSW landfill emissions can vary significantly from landfill to landfill and over time. Although the types of compounds are typically the same, the complex mixture cannot be characterized quantitatively in terms of single pollutants. The EPA thus views the complex air emission mixture from landfills to constitute a single designated pollutant.

Id. at 24474–24475. Thus, the argument that VOC or any other of the individual components of landfill gases are separately regulated under these provisions is incorrect and inconsistent with the regulatory text and record for these subparts.

Comment: The proposal preamble for this action cited CAA section 112(b)(2) and argued that the ''except'' phrasing of CAA section 112(b)(2) suggests that air pollutants which are ''listed under section 7408(a)'' can be read to include precursors to the pollutant that is listed under CAA section 108(a). The EPA provided that otherwise the pollutants that are described in the second part of the sentence (pollutants that meet the listing criteria and are precursors to a CAA section 108(a) pollutant) would not be an exception to the prohibition in the first part of the sentence. 84 FR 50272.

One commenter contends that the EPA's analogy to CAA section 112 to ostensibly demonstrate that Congress would have explicitly subjected precursors to regulation in CAA section 111(d) if it wanted to, because it did so in CAA section 112 is inapposite here. The commenter states that, first, as the EPA acknowledges, Congress provided a flexible definition of ''air pollutant'' depending on ''the particular purpose for which the term 'air pollutant' is used.'' The commenter states that the particular purpose for which the term ''air pollutant'' is used in CAA section 112 is quite different than in CAA section 111(d). The commenter notes that the relevant statutory provision in

CAA section 112 excludes from regulation as a HAP any ''air pollutant[s] listed under section [108(a)] . . . except that . . . precursor[s] to a pollutant which [are] listed under section [108(a)]'' can be regulated as a HAP. The commenter states that the EPA argues that to interpret the phrase ''air pollutant[s] listed under section [108(a)]'' as being exclusive of precursors would render meaningless the exception in CAA section 112(b)(2) for precursors. The commenter contends that it may be true in the context of CAA section 112, but it does not follow that the same interpretation applies in CAA section 111, which lacks such an express statutory exception.

Response: This commenter misunderstands the relevance of the text in CAA section 112(b)(2) in determining whether VOC are excluded from CAA section 111(d) regulation by the CAA section 108(a) exclusion. The EPA is not drawing an analogy to the outcome in CAA section 112(b)(2), which expressly removes precursors from the prohibition on the regulation under CAA section 112 of air pollutants listed under CAA section 108(a). The point here is that CAA section 112(b)(2) demonstrates that Congress understood that the phrase ''air pollutant listed under section 7408(a)'' could be read to encompass precursors. Moreover, in CAA section 112(b)(2) Congress included express language stating its choice: That regulation of precursors under CAA section 112 was not barred by the prohibition on regulating pollutants listed under CAA section 108(a). In CAA section 111(d), however, Congress did not state a choice; it stated an exclusion for pollutants listed under CAA section 108(a) without specifying whether that exclusion extended to precursors. This ambiguity, combined with the CAA section 302(g) definition of ''air pollutant'' that expressly gives the EPA the discretion to determine whether precursors are to be considered part of ''air pollutant'' on a case-by-case basis for each ''particular purpose for which the term 'air pollutant' is used,'' means that the EPA has to apply its expertise in administering the CAA program to determine whether the air pollutants excluded from CAA section 111(d) regulation by the CAA section 108(a) exclusion covers precursors. For all of the reasons discussed, the EPA has reasonably concluded that precursors are excluded by the CAA section 108(a) exclusion.

Comment: The proposal preamble for this action stated that ''CAA section 111(d) is properly understood as a 'gap-filling' measure to address pollutants that are not addressed under either the NAAQS/SIP provisions in CAA sections 108–110 or the HAP provisions in CAA section 112. Because VOC are regulated as precursors to ozone and $PM_{2.5}$ under CAA sections 108–110, they are properly excluded from regulation under CAA section 111(d) because the ''gap-filling'' function of CAA section 111(d) is not needed.'' 84 FR 50272. Some commenters agreed with the EPA's interpretation that CAA ''section 111(d) is properly understood as a 'gap filling' measure to address pollutants that are not addressed under either the NAAQS [SIP] provisions in CAA sections 108–110 or the [HAP] provisions in CAA section 112.'' These commenters generally note that regulation of existing sources under CAA section 111(d) is very rare and that the provision has been used only a handful of times, in part because it can only be triggered by a handful of pollutants and that Congress' inclusion of CAA section 111(d) can only be viewed as a safety valve for a limited number of circumstances. One commenter concludes that because VOC emissions are regulated under CAA section 108 and related statutory provisions as part of the NAAQS implementation program, they do not fall into this ''gap'' and cannot be regulated under CAA section 111(d).

Conversely, other commenters assert that the EPA's proposal preamble discussion regarding CAA section 111(d) as a gap-filling measure does not support the EPA's claim that Congress intentionally chose to exclude criteria pollutant precursors from regulation under CAA section 111(d) and that the ramifications of such an interpretation would be enormous.

The commenter states that the EPA makes a structural argument that excluding VOC from regulation under CAA section 111(d) makes sense with respect to that section's ''gap-filling'' role, since VOC are already ''regulated as pre-cursors under CAA sections 108–110'' and, thus, there is no gap to be filled. However, the commenter believes that this argument ignores the legislative history of CAA section 111(d). The commenter asserts that CAA section 111(d) began as a Senate proposal with an explicit list of pollutants to be regulated, and that ultimately, this explicit list was replaced with gradually broader phrasing until the language we see today was included in the 1970 CAA Amendments. The commenter adds that the legislative history reflects Congress' intent to give the EPA the flexibility to regulate a broad range of pollutants, rather than to constrain the EPA's discretion to a designated list of pollutants subject to regulation under CAA section 111(d). The commenter contends that the EPA's current interpretation would restrict the applicability of CAA section 111(d) to a narrower set of pollutants than Congress intended, and indeed, to a narrower set of pollutants than the Agency itself has regulated in the past. The commenter concludes that contrary to the EPA's assertions in its proposal, such a narrow interpretation upends the very idea of a ''gap-filling'' provision intended to give the Agency the flexibility to regulate a broad range of pollutants where necessary to fill gaps left by the NAAQS and NESHAP programs.

Response: The EPA disagrees with this comment. First, the argument that legislative history shows that Congress intended to give the EPA the authority to regulate a broad range of pollutants under CAA section 111(d) fails in the face of the statutory exclusions of pollutants that Congress enacted. The exclusions in CAA section 111(d) expressly narrowed the breadth of the pollutants that the EPA can regulate under CAA section 111(d). Second, the gap-filling role of CAA section 111(d) is properly understood to fill the gaps that exist *between* the regulatory regimes that address criteria/CAA section 108(a) pollutants and HAP—that is, the regulation of those pollutants that are not listed and regulated under those other CAA programs. CAA section 111(d) is not properly read to fill gaps that exist *within* those other CAA programs.

B. Impact of Lack of Regulation of Existing Oil and Natural Gas Sources Under CAA Section 111(d)

In the proposal preamble, the EPA stated that ''the lack of regulation of existing sources under CAA section 111(d) will not mean a substantial amount of lost emission reductions.'' 84 FR 50271. The proposal preamble provided several reasons for why there could be limited impact from not regulating existing oil and natural gas sources under CAA section 111(d), including (1) equipment turnover/ source modifications will result in existing sources being subject to the NSPS, (2) market incentives capture valuable methane product, (3) voluntary actions to reduce methane emissions are prevalent, and (4) state regulations result in emission reductions. The EPA received comments that both agree and disagree with the EPA's conclusions and reasoning presented in the proposal preamble. These comments and the EPA response to their comments are provided below.

Comment: Several commenters assert that the EPA's assertion that the lack of regulation of existing sources directly caused by the proposed rule to deregulate methane emissions from new sources will have ''limited impact,'' does not have sufficient supporting data or analysis, and is false and arbitrary and capricious. One commenter states that, although the EPA attempts to downplay the likely impact from its non-regulation of existing sources, the EPA fails either to define what it means by ''substantial'' or to provide evidence to support this claim.

The commenters state that it would not be rational or legal for the EPA to put blinders on in order to ignore the enormous consequences of rescinding methane regulation for existing sources. The commenters assert that section 111 of the CAA is concerned with reducing dangerous pollution from stationary sources—new, modified, and existing. *See, e.g.,* 42 U.S.C. 7411(b)(1)(B) (discussing ''new sources within such category''); *Id.* 42 U.S.C. 7411(d)(2)(B) (discussing existing sources as ''sources in the category of sources''). Some commenters state that while the EPA claims that ''[a]nalysis of potential impacts of removing the requirement to regulate existing sources under CAA section 111(d) is outside the scope . . . and would be speculative,'' the EPA's refusal to consider these impacts renders its proposal unlawful.

Response: The EPA acknowledges in the proposal preamble (84 FR 50271) that by rescinding the applicability of the methane NSPS for the sources in the Crude Oil and Natural Gas Production source category, existing sources of the same type in the source category will not be subject to regulation under CAA section 111(d). The EPA is not required under a CAA section 111(b) NSPS subpart OOOOa rulemaking, however, to consider the impacts of existing sources not being regulated under a hypothetical CAA section 111(d) rule as a result of amending a CAA section 111(b) rule. While the EPA did not prepare and include a quantitative analysis that estimates the levels at which source modification/equipment turnover, market incentives, voluntary programs, and state requirements—might limit potential emissions increases from not regulating existing sources, the EPA discusses how each of these factors currently contribute and will continue to contribute to the downward trend of total methane emissions from oil and natural gas existing sources in absence of an EG in absence of existing source CAA section 111(d) guidelines.

The EPA concedes, however, that the use of the term ''substantial'' conveys a quantitative value, and that it would have been more accurate in absence of a quantitative analysis to state that these factors all have the potential to motivate or require operators to control emissions from existing sources in absence of a CAA section 111(d) EG. Further detail regarding comments received on the potential for limiting emissions from existing sources for each of these factors, and responses to these comments are provided below.

Comment: Several commenters suggest that the EPA's claim that equipment turnover, market incentives, voluntary actions, and state regulations will mean that there will not be a substantial loss of emission reductions is inconsistent with findings the EPA itself made in prior rulemakings, including the 2016 Rule. The commenters state that the EPA has provided no rational basis for its drastic shift in position (citing *Lone Mountain Processing, Inc.* v. *Secretary of Labor,* 709 F.3d 1161, 1164 (D.C. Cir. 2013)).

Response: The EPA's notes that changes have occurred since the earlier rulemakings that affect emissions from existing oil and natural gas sources. For example, there is greater industry participation in voluntary methane emissions reduction programs/actions and more state regulations/permits limiting emissions from oil and natural gas operations than there were when the EPA developed the 2016 Rule.

Comment: Commenters contend that the EPA cannot support not establishing standards under CAA section 111(d) based on source modification/equipment turnover, market incentives, voluntary programs, or state requirements factors mitigating potential emissions increases from not regulating existing sources. The commenters note that the cited factors are precisely the ones that Congress rejected when it chose to require uniform national standards. The commenters also note that the CAA is clear: The EPA ''shall prescribe regulations'' for existing sources in listed source categories that are subject to new source requirements for air pollutants not regulated under the NAAQS or section 112. 42 U.S.C. 7411(d)(1). The commenters suggest that the EPA's reliance on source modification, market incentives, voluntary programs, and state requirements to justify the proposal exceeds the Agency's authority under the CAA (citing *Massachusetts* v. *EPA,* 549 U.S. 497, 533–535 (2007) (the EPA cannot rely on a ''laundry list of reasons not to regulate'' when there is a ''clear statutory command'' under the CAA)).

Response: The EPA recognizes that rescinding the applicability of the NSPS to methane emissions for the sources in the Crude Oil and Natural Gas Production source category that are currently covered by the NSPS will mean that existing sources of the same type in the source category will not be subject to regulation under CAA section 111(d). The reasoning for not developing a CAA section 111(d) standard is not because source modification, market incentives, voluntary programs, and state requirements will limit emissions increases that may result from not pursuing a CAA section 111(d) standard. Rather, this is a legal consequence that results from the application of the CAA section 111 requirements.

Comment: Several commenters specifically provide support for, and opposition to, the individual factors (equipment turnover/source modifications, market incentives, voluntary actions, and state regulation) cited by the EPA as mitigating emission increases as a result of not regulating existing sources.

Equipment turnover/source modifications. One of the factors that the EPA provided in the proposal for the limited impact of the lack of regulation of existing sources under CAA section 111(d) was ''that the number of existing sources may decline over time due to obsolescence or to shut down and removal actions.'' 84 FR 50273. The EPA provided analysis to support this rationale and also solicited comment regarding the rate at which this decline can be expected to occur. One commenter supported the proposal by stating that because CAA section 111 defines an ''existing source'' as one that is not a ''new source,'' the universe of existing oil and natural gas sources potentially subject to CAA section 111(d) requirements would be any affected facility for which construction commenced on or before September 18, 2015, indicating that any ''existing source'' has already been in operation for at least 4 years. The commenter contends that even if the EPA were to issue EG for methane for these sources today, the Agency's 40 CFR part 60, subpart Ba regulations implementing CAA section 111(d) (Emission Guidelines for Municipal Solid Waste Landfills) provide states with 3 years to develop and submit their state plans. The commenter notes that these state plans may provide a source with up to 24 months to comply with emission standards (or longer if the compliance schedule includes legally enforceable increments of progress), and states retain discretion under CAA section 111(d) and the regulations to further extend these compliance deadlines for an individual source based on its remaining useful life or other factors. The commenter states that by the time CAA section 111(d) emission standards would become effective, roughly 10 years will have passed since the date marking the cutoff between ''new'' and ''existing'' sources. During that time period, the commenter states, it is likely that sources constructed before this cutoff will have been plugged and abandoned or replaced with new equipment that would itself be subject to the VOC requirements of NSPS subpart OOOO (which will also reduce associated methane emissions). The commenter adds that those existing oil and natural gas sources that are not plugged and abandoned or replaced may also undergo changes that qualify as ''modifications'' under NSPS subpart OOOOa, and in that case would be treated as new sources.

Conversely, several other commenters express concern that the EPA has not supported its claim that source turnover is one reason for the limited impact of not regulating existing sources. One commenter contends that the EPA's withdrawal of the ICR, coupled with its lack of information that could support a reasoned analysis, makes its action arbitrary and capricious. One commenter notes that the average life of an oil and natural gas well is 20 to 30 years, meaning that facilities installed prior to September 2015 could still be in operation in September 2045. The commenter points out that many of the largest-emitting facilities (*e.g.,* field storage tanks) typically do not undergo modification or reconstruction during their useful life.

Another commenter asserts that the EPA's claim that the existing source inventory will turn over is undercut by the EPA's extensive list, in the 2019 Proposal preamble, of questions to stakeholders about the rate of modification practices within the sector. The commenter states that the existence of the EPA's extensive list of questions indicates that the EPA has little information on how regularly these transitions occur and cannot claim that there will be little emissions impacts until after the Agency has analyzed the information that it requests.

Some commenters assert that the EPA-cited data from the U.S. Greenhouse Gas Inventory (GHGI) (for pneumatic controllers, compressors, tank throughput, and well completions); *Drillinginfo.com* (for well completions); and NSPS subpart OOOOa compliance reports (for assessing turnover rates) do not support the EPA's turnover conclusions, and exhibit substantial limitations for assessing turnover and obsolescence rates. For example, the commenters note that the GHGI provides absolute source counts for each year, but does not include information on specific sources—meaning it is not possible to assess the number of sources that are new, the number that have ceased operation, or the number that have remained in use over a time period.

Furthermore, the commenters contend that the EPA's analysis ignores large sources of emissions, such as reciprocating compressors and all leaks downstream of well pads. The commenters address the data the EPA provided by source (*i.e.,* pneumatic controllers, compressors, storage vessels, well completions) to illustrate their point that the data are insufficient or do not support the EPA's claim that many existing sources will become ''modified'' sources in the future, while other existing sources will be replaced by new facilities or shut down.

Some commenters also assert that the compliance reports and the preliminary data submitted in response to the ICR indicate that the large majority of facilities in the oil and natural gas sector are not currently complying with the NSPS. This means, according to the commenters, that these sources are existing sources with limited turnover. One commenter adds that records of natural gas operations in New Mexico demonstrates that numerous oil and natural gas fugitive emissions sources, storage tanks, and loadout emissions sources with construction dates going back to 1970 have not been modified, reconstructed, or replaced with new equipment.

Market incentives. Many commenters generally agree with the EPA's statements in the 2019 Proposal that market incentives already provide a powerful impetus for owners and operators of sources in the oil and natural gas industry to limit their methane emissions. Commenters state that the fact that the ''pollutant'' at issue is itself a valuable commodity means that source owners and operators have economic incentives to prevent its release in order to maximize the amount of natural gas that is sold for revenue. One commenter notes that the EPA's data bear that out, demonstrating that over the past 80 years, the fraction of natural gas withdrawals lost to venting and flaring has decreased from over 20 percent to just 1 or 2 percent.

Conversely, other commenters contend that there are a number of flaws with the EPA's theory that market incentives will meaningfully address methane emissions from existing oil and natural gas sources. First, one commenter notes that these theoretical ''market incentives'' largely depend on natural gas price trajectories, and contends that the EPA fails to conduct any analysis of how operators might be anticipated to reduce their emissions in light of expected natural gas prices. In reality, the commenter states, examples abound of operators choosing to flare or vent gas, rather than capture it, under current market prices. Second, a commenter states that the EPA ignores a fundamental economic principle in its discussion of market incentives: When there is a negative externality associated with an activity (here, the emission of both climate-disrupting and conventional pollution) that is not reflected in an individual operator's costs, market incentives are typically insufficient to reduce the activity to socially optimal levels. Third, a commenter states that the emissions trends noted by the EPA do not support the proposition that market incentives are adequate to reduce methane emissions from existing sources; and in fact, the data cited by the EPA shows that emissions from the oil and natural gas industry have remained persistently high despite those incentives.

Voluntary actions. Several commenters present information regarding existing voluntary programs and methane mitigation strategies being employed to reduce methane emissions from oil and natural gas operations. These commenters present a series of voluntary programs/strategies that the industry is currently undertaking and will continue to undertake to help reduce its methane emissions.

One industry representative organization [American Petroleum Institute (API)] adds that participants in The Environmental Partnership's Leak Detection and Repair Program reported a leak occurrence rate of just 0.16 percent, and that figure comes from more than 156,000 surveys across more than 78,000 production sites and is an important signal that ongoing industry efforts to identify and fix emissions sources are working.

Several other commenters contend that voluntary measures to control methane emissions would not compensate for the removal of the Federal methane requirements. Commenters note that of the thousands of oil and natural gas sources across the U.S., only about 1 percent participate in voluntary programs to address methane emissions (citing *http://blogs.edf.org/energyexchange/2019/09/03/epas-proposal-to-rollback-methane-rules-ignores-scientific-evidence-will-lead-to-5-million-tons-of-methane-pollution/*).

Commenters note that even industry members that have participated in these voluntary programs have noted that they are not a substitute for strong, uniform regulatory requirements. In addition, some commenters state that while voluntary efforts are important for reducing emissions and understanding how production operations can become more efficient and deliver environmental benefits, they cannot replace uniform Federal methane regulations for the oil and natural gas industry.

State regulations. Some commenters agree with the EPA that there are several states—including many of the states with the most significant oil and natural gas activity levels, that are already taking actions to reduce VOC and, by extension, methane emissions. One commenter states that while not every state has adopted such regulations, the states the EPA cites in the proposal cover the vast majority of the nation's oil and natural gas production, and while not every state's regulatory program covers all of the emission sources listed in NSPS subparts OOOO and OOOOa, they do all include regulatory requirements for storage vessels and fugitive emissions at well sites, ''two of the largest emission sources within the oil and natural gas industry.'' Another commenter concludes that current regulations of VOC emissions in North Dakota and other top oil and natural gas producing states will be sufficient to reduce methane emissions from the oil and natural gas industry, and that the participation of those states in national organizations such as the Environmental Council of the States (ECOS) are generating increasingly consistent state requirements that will meaningfully reduce emissions should the proposed amendments be finalized.

Other commenters assert that emissions control requirements of state regulatory programs will not be sufficient to reduce methane emissions. Commenters note that California, Colorado, Montana, New Mexico, North Dakota, Ohio, Pennsylvania, Texas, Utah, and Wyoming—the states that the EPA includes in the Proposal's ''Comparison of State Oil and Natural Gas Regulations'' table, 84 FR 50277—take widely divergent approaches that vary significantly in stringency, and most states have no standards applicable to existing sources. In 2020, according to the commenters, state standards applicable to existing sources (certain standards in California, Colorado, Utah, Wyoming (in the Upper Green River Basin ozone non-attainment area), and Texas) will reduce only 180,000 metric tons of methane, roughly 5 percent of what CAA section 111(d) guidelines modeled on the current NSPS could achieve. Other commenters added that regulation of existing sources by the EPA under section 111(d) of the CAA is preferable to a patchwork of regulations created separately by each state Agency (or the lack of regulation in some states). One commenter explains that Federal regulation creates a consistent framework that establishes a minimum level of emission control that strengthens public confidence in the natural gas industry and ensures GHG emission reductions.

Modeling analyses of impacts of foregone regulation of existing sources. Commenters presented two competing modeling analyses estimating the potential impacts of not pursuing EGs under CAA section 111(d). One presented by API supported the EPA's statements in the 2019 Proposal that the impacts would be limited, and one presented by the Environmental Defense Fund (EDF) disputed the EPA's claim.[73] [74] The assumptions used in these analyses vary; including the assumed EG requirements, the date when emissions that could have and would be controlled under an EG, what sources/segments the EG would cover, and how they accounted for turnover rates and state regulations when projecting emissions from existing sources. Neither of these analyses provide sufficient detail by emission source by segment to do a direct comparison of their analyses. However, the most important driver of differences between the competing analyses appears to be the differing assumptions regarding the emissions sources and segments the EG would regulate and the date when emissions could have and would be controlled under an EG.

The API Analysis includes a subset of emission sources compared to the EDF Analysis. The API Analysis includes the following production sources: Storage vessels, pneumatic devices, pneumatic pumps, and fugitive emissions from non-low production wells—it does not include low production wells, reciprocating/centrifugal compressors, or fugitive emissions from gathering and boosting compressor stations based on what was covered under the 2016 *Control Techniques Guidelines for the Oil and Natural Gas Industry.*[75] The EDF Analysis assumes that the EG will extend the requirements found in the 2016 Rule to all affected existing sources, specifically: High-bleed pneumatic controllers at well sites and transmission and storage compressor stations, all continuous bleed pneumatic controllers at natural gas processing plants, fugitive emissions from gas processing plants, well sites, and compressor stations, reciprocating and centrifugal compressors at both processing plants and compressor stations, and pneumatic pumps at well sites and processing plants. The EDF Analysis estimates emissions uncontrolled from existing sources starting in 2017 that would have been controlled by an EG and API assumes that an EG would not have been implemented (and, therefore, uncontrolled emissions as a result of a lack of an EG would not apply) until 2028. In absence of any other assumptions, this difference leads to vastly different results.

According to the API Analysis, if an existing source rule were implemented in 2028, minimal methane emission reductions (5 percent – (102,000 MT (metric tons) methane) from NSPS regulated sources would be realized with their hypothetical reductions decaying to ~1 percent (24,000 MT) of the total emissions from regulated sources by 2043. The API Analysis concludes that by 2028, 94 percent (and by 2043, 99 percent) of oil and natural gas production will be regulated by 40 CFR part 60, subpart OOOO or OOOOa. In other words, the API Analysis estimates that an EG modeled after a modified version of the EPA's 2016 Control Techniques Guideline would only achieve an additional 5 percent of emissions reductions when compared to the NSPS regulations alone. The API provides that their analysis illustrates that an existing source rule would provide negligible environmental benefit.

This is in contrast to the EDF Analysis that estimates that each year that the EPA does not promulgate EG under CAA section 111(d) will allow substantial additional emissions. They estimate emissions that have occurred and will occur starting in 2017 through 2030 by the EPA's failure to adopt EGs, as well as the emission reductions possible if EGs were promulgated. For example, they estimate that, in 2021, 9.8

[73] Earth Systems Sciences, LLC (for API). Methane Emissions from Regulated Onshore Production Sources. Evaluating the Impact of Existing Federal and State Regulations. October 2019. (Docket ID Item No. EPA–HQ–OAR–2017–0757–2090, Appendix A) (API Analysis).

[74] EDF. Assessment of Harm to the Public from Foregoing Methane Guidelines for Existing Sources. November 21, 2019. (Docket ID Item No. EPA–HQ–OAR–2017–0757–2134; Appendix D) (EDF Analysis).

[75] U.S. EPA. Control Techniques Guidelines for the Oil and Natural Gas Industry. October 2016. EPA–453–/B–16–001). *https://www.epa.gov/sites/production/files/2016-10/documents/2016-ctg-oil-and-gas.pdf.*

million metric tons of methane will be emitted by affected existing sources. The EDF Analysis estimates that by 2030, emissions from existing sources will be substantial and have a cumulative impact of about 126 MMT of methane; about 29 MMT of VOC; and about 1.1 million tons of HAP. The EDF Analysis estimates that in the over 3 years since the EPA has promulgated the 2016 Rule, 33.4 MMT of methane have been emitted by existing oil and natural gas sources. They further estimate that 12.2 MMT of those methane emissions, or 37 percent, could have been avoided if EGs were in effect.

Response: The EPA's response to comments specific to the four factors cited by the EPA in the proposal preamble for why there would be limited impacts from not regulating existing oil and natural gas sources under CAA section 111(d), are provided in the following paragraphs. *Equipment turnover/source modifications.* For the first factor (equipment turnover/source modifications will result in existing sources being subject to the NSPS), the EPA reviewed information and analyses supporting the proposal's claim of a high turnover rate (limited impact of an EG) and information/analyses that supporting a low turnover rate (substantial impact of an EG).

Referring to the API and EDF Analyses, each of those analyses accounted for turnover and source modifications differently in their emissions projections in absence of an EG under CAA section 111(d). The approaches used and information provided in these analyses do not allow for a direct comparison on how their differing assumptions impact their results. The API Analysis does not include modification triggers in their projection modeling, contending that the lack of modification triggers in their model is a conservative assumption because it will underestimate the number of wells that are covered by NSPS requirements in the future. However, the API Analysis used historical well records to estimate a distribution for the expected lifetime of wells (and associated equipment) in each state. The EDF Analysis assumes that emissions attributable to existing sources decline year-over-year as existing sources are removed from operation or undertake modifications that subject them to regulation as modified sources under the 2016 Rule based on turnover rate percentages. Insufficient detail provided by EDF on where the turnover percentage rates they used in their analysis came from. It is unclear how the percentages used (existing source decline turnover rate of 5 percent for production sources, 4 percent for gathering and boosting sources, and 1 percent for all downstream sources) in the EDF Analysis were estimated.

The EPA recognizes the limitations pointed out by commenters regarding the GHGI (for pneumatic controllers, compressors, tank throughput, and well completions); *Drillinginfo.com* (for well completions); and NSPS subpart OOOOa compliance reports (for assessing turnover rates). As commenters indicate, when comparing activity counts, compliance reports, and preliminary information received in the ICR process, the data indicates that there is incomplete information to assess turnover and obsolescence rates. The justification of the EPA's rescission of the ICR is presented in a separate rulemaking action, ''Notice Regarding Withdrawal of Obligation To Submit Information'' (82 FR 12817, March 7, 2017). Absent further information (which is why we solicited comment on turnover rates) and time, where compliance report information can be assessed over a longer time period, there will continue to be a high level of uncertainty with any estimates on turnover/obsolescence rates.

The EPA maintains, however, as it did in the proposal, that equipment turnover and source modification are a factor (albeit difficult to quantify with any certainty) that will limit the emissions from existing sources in the oil and natural gas industry in the absence of a CAA section 111(d) EG. In addition to the reasons stated in the proposal, we acknowledge that it could take up to 7 to 10 years from date of promulgation of an EG for requirements to be fully implemented. During this time, the EPA expects that a percentage of existing sources will shut down or undertake modification, which will result in them becoming subject to regulation under CAA section 111(b). This turnover, in the case of well-sites, would likely be impacted as production declines and dependent on the economic viability of the well-site.

Lastly, the EPA acknowledges the information the state of New Mexico identifies that indicates that there are existing sources in that state that have never been modified as supporting that turnover and modifications will not be a factor that results in reducing emissions from oil and natural gas existing sources in that area in absence of an EG and accepts that these are examples of existing sources that have continued to operate for long periods of time without being reconstructed or modified.

Market incentives. With regards to the second factor (market incentives), as stated in section VII.B of this preamble, there are market incentives for the oil and natural gas industry to capture as much natural gas (and, by extension, methane) as is cost effective. Depending on the future trajectories of natural gas prices and the costs of natural gas capture and emission reductions, market incentives may continue to drive emission reductions, even in the absence of specific regulatory requirements applicable to methane emissions from existing sources. While it is a challenging concept to quantify in monetary terms, improving their environmental performance is increasingly important for firms to maintain a ''social license to operate.'' Generally speaking, the social license to operate means that the firm's employees, investors, customers, and the general public find that the firm's business activities and operations are acceptable to continue to freely participate in the marketplace. Maintaining the social license by improving environmental performance, such as reducing emissions, can help firms respond to the complex environment within which they operate in ways that are favorable to their longer-term business interests.

In response to the commenter that states that the emissions trends noted by the EPA do not support the proposition that market incentives are adequate to reduce methane emissions from existing sources in lieu of Federal regulation, the EPA is not making that claim. The EPA claims that market incentives are one factor (among others) that contribute and will continue to contribute to the downward trend of total methane emissions from oil and natural gas existing sources in absence of an EG.

Voluntary action. With regards to the third factor (voluntary actions), the EPA maintains, and has received a lot of comments in support of, its position that the plethora of voluntary methane emissions mitigation programs will limit (among other factors) methane emissions increases from existing oil and natural gas industry emission sources in absence of a CAA section 111(d) EG. The EPA does acknowledge, however, as several commenters contend, that the industry as a whole is not uniformly meeting voluntary measures at the same level of control and that some companies may not be participating in cited voluntary methane emissions programs at all. This makes it difficult to verify the impacts on emissions as a result of voluntary program participation. Additional time will be needed to allow these programs to further develop and to be fully implemented to better quantify the impacts the varied programs have on limiting emissions from oil and natural gas industry sources.

In response to the commenters that contend that voluntary actions cannot be relied upon to reduce methane emissions from existing sources in lieu of Federal regulation, the EPA is not making that claim. As with other mitigating factors cited by the EPA, voluntary actions are one factor (among others) that contribute and will continue to contribute to the downward trend of total methane emissions from oil and natural gas existing sources in absence of an EG.

State regulations. With regards to the fourth and final factor (state regulations), the EPA agrees that there could be an impact of not regulating existing oil and natural gas sources, but at this time, the EPA has not conducted a quantitative analysis of the impact of state regulatory programs to determine the degree to which those programs would reduce emissions from existing sources. The EPA also acknowledges that state requirements do vary in stringency and that only a subset of states include requirements for sources that the EPA could potentially define as existing sources. However, those states that have standards applicable to existing sources (certain standards in California, Colorado, Utah, Wyoming (in the Upper Green River Basin ozone non-attainment area), and Texas) account for a substantial portion of oil and natural gas production in the United States. The EPA also expects a percentage of existing sources to shut down or undertake modification which would make them become subject to certain state standards or permits. As one of the commenters points out, and the EPA agrees, while not every state has adopted specific methane emissions regulations for oil and natural gas industry existing sources, current regulations (and permits) controlling VOC emissions in North Dakota and other top oil and natural gas producing states will concurrently reduce methane emissions from the oil and natural gas industry.

In response to the commenters that contend that state regulations/permits that include oil and natural gas industry existing source emissions control requirements cannot be relied upon to reduce methane emissions from existing sources in lieu of Federal regulation, the EPA is not making that claim. As with other mitigating factors cited by the EPA, existing source state requirements are one factor (among others) that contribute and will continue to contribute to the downward trend of total methane emissions from oil and natural gas existing sources in absence of an EG.

XI. Impacts of This Final Rule

A. What are the air impacts?

The EPA projected that, from 2021 to 2030, relative to the baseline, the final rule will forgo about 448,000 short tons of methane emissions reductions (10.1 million tons CO_2 Eq.), 12,000 short tons of VOC emissions reductions, and 400 short tons of HAP emission reductions from facilities affected by this reconsideration.[76] The EPA estimated regulatory impacts beginning in 2021 as it is the first full year of implementation of this rule. The EPA estimated impacts through 2030 to illustrate the accumulating effects of this rule over a longer period. The EPA did not estimate impacts after 2030 for reasons including limited information, as explained in the RIA.

B. What are the energy impacts?

Energy impacts in this section are those energy requirements associated with the operation of emissions control devices. Potential impacts on the national energy economy from the rule are discussed in the economic impacts section. Under the final rule, there will likely be little change in the national energy demand resulting from the deregulatory actions finalized here.

C. What are the compliance costs?

The PV of the regulatory compliance cost reduction associated with this final rule over the 2021 to 2030 period was estimated to be $67 million (in 2016 dollars) using a 7-percent discount rate and $83 million using a 3-percent discount rate. The EAV of these cost reductions is estimated to be $8.9 million per year using a 7-percent discount rate and $9.4 million per year using a 3-percent discount rate.

These estimates do not, however, include the forgone producer revenues associated with the decrease in the recovery of saleable natural gas, though some of the compliance actions required in the baseline would likely have captured saleable product that would have otherwise been emitted to the atmosphere. Estimates of the value of the recovered product were included in previous regulatory analyses as offsetting compliance costs. Because of the deregulatory nature of this final action, the EPA projected a reduction in the recovery of saleable product. Using the 2020 Annual Energy Outlook (AEO) projection of natural gas prices to estimate the value of the change in the recovered gas at the wellhead projected to result from the final action, the EPA estimated a PV of regulatory compliance cost reductions of the final rule over the 2021 to 2030 period of $31 million using a 7-percent discount rate and $38 million using a 3-percent discount rate. The corresponding estimates of the EAV of cost reductions after accounting for the forgone revenues were $4.1 million per year using a 7-percent discount rate and $4.3 million per year using a 3-percent discount rate.

D. What are the economic and employment impacts?

The EPA used the National Energy Modeling System (NEMS) to estimate the impacts of the 2016 Rule on the U.S. energy system. The NEMS is a publicly available model of the U.S. energy economy developed and maintained by the EIA and is used to produce the AEO, a reference publication that provides detailed projections of the U.S. energy economy.[77] The EPA estimated small impacts on crude oil and natural gas markets of the 2016 Rule over the 2020 to 2025 period. This final rule will result in a decrease in total compliance costs relative to the baseline. Therefore, the EPA expects that this rule will partially reduce the impacts estimated for the 2016 Rule in the 2016 Rule RIA.

Executive Order 13563 directs Federal agencies to consider the effect of regulations on job creation and employment. According to the Executive order, ''our regulatory system must protect public health, welfare, safety, and our environment while promoting economic growth, innovation, competitiveness, and job creation. It must be based on the best available science.'' (Executive Order 13563, 2011). While a standalone analysis of employment impacts is not included in a standard benefit-cost analysis, such an analysis is of concern in the current economic climate given continued interest in the employment impact of regulations such as this proposed rule. The EPA estimated the change in compliance-related labor due to the reduced requirements for the installation, operation, and maintenance of control equipment, control activities, and labor associated with reporting and recordkeeping requirements in the 2016

[76] In a separate action, the EPA is finalizing technical reconsideration amendments to 40 CFR part 60, subpart OOOOa (EPA–HQ–OAR–2017–0483; FRL–10013–60–OAR; FR Doc. 2020–18115). These technical amendments were proposed in October 2018. 83 FR 52056. Please reference that final rule for the summary and rationale of those technical changes. Please refer to the RIA for both rules to see the combined impacts.

[77] *https://www.eia.gov/outlooks/aeo/.*

Rule RIA. Under the final rule, the EPA expects there will be slight reductions in the labor required for compliance-related activities associated with the 2016 Rule requirements relating to the rescission of requirements in the transmission and storage segment of the oil and natural gas industry.

E. What are the benefits of the final standards?

The EPA expects forgone climate and health benefits due to the forgone emissions reductions projected under this final rule. The EPA estimated the forgone domestic climate benefits from the forgone methane emissions reductions using an interim measure of the domestic social cost of methane (SC-CH_4). The SC-CH_4 estimates used here were developed under Executive Order 13783 for use in regulatory analyses until an improved estimate of the impacts of climate change to the U.S. can be developed based on the best available science and economics. Executive Order 13783 directed agencies to ensure that estimates of the social cost of GHG used in regulatory analyses ''are based on the best available science and economics'' and are consistent with the guidance contained in OMB Circular A–4, ''including with respect to the consideration of domestic versus international impacts and the consideration of appropriate discount rates'' (Executive Order 13783, Section 5(c)). In addition, Executive Order 13783 withdrew the technical support documents (TSDs) and the August 2016 Addendum to these TSDs describing the global social cost of GHG estimates developed under the prior Administration as no longer representative of government policy. The withdrawn TSDs and Addendum were developed by an interagency working group that included the EPA and other executive branch entities and were used in the 2016 Rule RIA.

The EPA estimated the PV of the forgone domestic climate benefits over the 2021 to 2030 period to be $17 million under a 7-percent discount rate and $63 million under a 3-percent discount rate. The EAV of these forgone benefits is estimated $2.2 million per year under a 7-percent discount rate and $7.2 million per year under a 3-percent discount rate. These values represent only a partial accounting of domestic climate impacts from methane emissions and do not account for health effects of ozone exposure from the increase in methane emissions.

Under the final rule, the EPA expects that forgone VOC emission reductions will degrade air quality and are likely to adversely affect health and welfare associated with exposure to ozone, $PM_{2.5}$, and HAP, but did not quantify these effects at this time. This omission should not imply that these forgone benefits may not exist; rather, it reflects the inherent difficulties in accurately modeling the direct and indirect impacts of the projected reductions in emissions for this industrial sector. To the extent that the EPA were to quantify these ozone and PM impacts, it would estimate the number and value of avoided premature deaths and illnesses using an approach detailed in the Particulate Matter NAAQS and Ozone NAAQS Regulatory Impact Analyses.[78 79] This approach relies on full-form air quality modeling. The Agency is committed to assessing ways of conducting full-form air quality modeling for the oil and natural gas sector that would be suitable for use in regulatory analysis in the context of NSPS, including ways to address the uncertainties regarding the scope and magnitude of VOC emissions.

When quantifying the incidence and economic value of the human health impacts of air quality changes, the Agency sometimes relies upon alternative approaches to using full-form air quality modeling, called reduced-form techniques, often reported as ''benefit-per-ton'' values that relate air pollution impacts to changes in air pollutant precursor emissions.[80] A small, but growing, literature characterizes the air quality and health impacts from the oil and natural gas sector.[81 82 83] The Agency feels more work needs to be done to vet the analysis and methodologies for all potential approaches for valuing the health effects of VOC emissions before they are used in regulatory analysis, but is committed to continuing this work. Recently, the EPA systematically compared the changes in benefits, and concentrations where available, from its benefit-per-ton technique and other reduced-form techniques against the changes in benefits and concentrations derived from full-form photochemical model representation of a few different specific emissions scenarios.[84] The Agency's goal was to create a methodology by which investigators could better understand the suitability of alternative reduced-form air quality modeling techniques for estimating the health impacts of criteria pollutant emissions changes in the EPA's benefit-cost analysis, including the extent to which reduced form models may over- or under-estimate benefits (compared to full-scale modeling) under different scenarios and air quality concentrations. The EPA Science Advisory Board (SAB) recently convened a panel to review this report.[85] In particular, the SAB will assess the techniques the Agency used to appraise these tools; the Agency's approach for depicting the results of reduced-form tools; and, steps the Agency might take for improving the reliability of reduced-form techniques for use in future Regulatory Impact Analyses RIAs. The scenario-specific emission inputs developed for this project are currently available online.[86] A thorough description of the study design and methodology is also available.[87]

XII. Statutory and Executive Order Reviews

Additional information about these statutes and Executive orders can be found at *https://www.epa.gov/laws-regulations/laws-and-executive-orders*.

[78] U.S. EPA. December 2012. Regulatory Impact Analysis for the Final Revisions to the National Ambient Air Quality Standards for Particulate Matter. EPA–452/R–12–005. Office of Air Quality Planning and Standards, Health and Environmental Impacts Division. *https://www3.epa.gov/ttnecas1/regdata/RIAs/finalria.pdf.* Accessed January 9, 2020.

[79] U.S. EPA. September 2015. Regulatory Impact Analysis of the Final Revisions to the National Ambient Air Quality Standards for Ground-Level Ozone. EPA–452/R–15–007. Office of Air Quality Planning and Standards, Health and Environmental Impacts Division. *https://www3.epa.gov/ttnecas1/docs/20151001ria.pdf.* Accessed January 9, 2020.

[80] U.S. EPA. February 2018. Technical Support Document: Estimating the Benefit per Ton of Reducing $PM_{2.5}$ Precursors from 17 Sectors. *https://www.epa.gov/sites/production/files/2018-02/documents/sourceapportionmentbpttsd_2018.pdf.* Accessed January 9, 2020.

[81] Fann, N., K.R. Baker, E.A.W. Chan, A. Eyth, A. Macpherson, E. Miller, and J. Snyder. 2018. ''Assessing Human Health $PM_{2.5}$ and Ozone Impacts from U.S. Oil and Natural Gas Sector Emissions in 2025.'' Environmental Science and Technology 52(15):8095–8103.

[82] Litovitz, A., A. Curtright, S. Abramzon, N. Burger, and C. Samaras. 2013. ''Estimation of Regional Air-Quality Damages from Marcellus Shale Natural Gas Extraction in Pennsylvania.'' Environmental Research Letters 8(1), 014017.

[83] Loomis, J. and M. Haefele. 2017. ''Quantifying Market and Non-market Benefits and Costs of Hydraulic Fracturing in the United States: A Summary of the Literature.'' Ecological Economics 138:160–167.

[84] This analysis compared the benefits estimated using full-form photochemical air quality modeling simulations (CMAQ and CAMx) against four reduced-form tools, including: InMAP; AP2/3; EASIUR; and EPA's benefit-per-ton.

[85] 85 FR 23823 (April 29, 2020).

[86] The scenario-specific emission inputs developed for this project and all associated documentation are currently available online at *https://github.com/epa-kpc/RFMEVAL.*

[87] Baker, K.R., M. Amend, S. Penn, J. Bankert, H. Simon, E. Chan, N. Fann, M. Zawacki, K. Davidson, K. and H. Roman. 2020. ''A Database for Evaluating the InMAP, APEEP, and EASIUR Reduced Complexity Air-Quality Modeling Tools.'' Data in Brief 28: 104886.

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is a significant regulatory action that was submitted to the Office of Management and Budget (OMB) for review because it raises novel legal or policy issues. Any changes made in response to OMB recommendations have been documented in the docket. In addition, the EPA prepared an RIA of the potential costs and benefits associated with this final action. The RIA available in the docket describes in detail the empirical basis for the EPA's assumptions and characterizes the various sources of uncertainties affecting the estimates below. Table 8 shows the PV and EAV of the costs, benefits, and net benefits of the final rule for the 2021 to 2030 period relative to the baseline using discount rates of 7 and 3 percent, respectively. The table also shows the total forgone emission reductions projected from 2021 to 2030 relative to the baseline.

In the following table, we refer to the compliance cost reductions as the ''benefits'' and the forgone benefits as the ''costs'' of this final action. The net benefits are the benefits (total cost reductions) minus the costs (forgone domestic climate benefits).

TABLE 8—SUMMARY OF THE PV AND EAV OF THE MONETIZED FORGONE BENEFITS, COST REDUCTIONS, AND NET BENEFITS FROM 2021 TO 2030, 7- AND 3-PERCENT DISCOUNT RATES

[Millions of 2016$]

	7-Percent discount rate		3-Percent discount rate	
	PV	EAV	PV	EAV
Benefits (Total Cost Reductions)	$31	$4.1	$38	$4.3
Compliance Cost Reductions	*67*	*8.9*	*83*	*9.4*
Forgone Value of Product Recovery	*36*	*4.7*	*45*	*5.1*
Costs (Forgone Domestic Climate Benefits)	17	2.2	63	7.2
Net Benefits	14	1.9	−25	−2.9
Non-Monetized Forgone Benefits	Non-monetized climate impacts from increases in methane emissions. Health effects of $PM_{2.5}$ and ozone exposure from an increase of about 11,000 short tons of VOC from 2021 through 2030. Health effects of HAP exposure from an increase of about 330 short tons of HAP from 2021 through 2030. Health effects of ozone exposure from an increase of about 400,000 short tons of methane from 2021 through 2030. Visibility impairment. Vegetation effects.			

Note: Estimates may not sum due to independent rounding.

B. Executive Order 13771: Reducing Regulations and Controlling Regulatory Costs

This action is considered an Executive Order 13771 deregulatory action. Details on the estimated cost savings of this final rule can be found in the EPA's analysis of the potential costs and benefits associated with this action.

C. Paperwork Reduction Act (PRA)

The information collection activities in this final rule have been submitted for approval to OMB under the PRA. The ICR document that the EPA prepared has been assigned EPA ICR number 2604.02 and OMB Control Number 2060–0729. The information collection requirements are not enforceable until OMB approves them.

A summary of the information collection activities previously submitted to the OMB for the final action titled ''Standards of Performance for Crude Oil and Natural Gas Facilities for Construction, Modification, or Reconstruction'' (2016 Rule) under the PRA, and assigned OMB Control Number 2060–0721 (EPA ICR number 2523.02), can be found at 81 FR 35890. You can find a copy of the ICR in the 2016 Rule Docket (Docket ID Item No. EPA–HQ–OAR–2010–0505–7626). In this rule, the EPA is finalizing the information collection activities as a result of the EPA's review under Executive Order 13783 (EPA ICR number 2604.02). These final changes (2020 NSPS Subpart OOOOa Executive Order 13783 Review Final) would remove reporting and recordkeeping requirements associated with the rescinded requirements.[88]

Comments were received on the October 15, 2018 (83 FR 52056) proposed rule indicating that the recordkeeping and reporting burden for the 2016 Rule was significantly underestimated. In particular, the commenters pointed to the estimated burden associated with the fugitive emissions requirements. As a result of these comments, the EPA reexamined the analysis for the 2016 Rule recordkeeping and reporting burden and made adjustments where warranted. This resulted in an updated and more accurate assessment of the recordkeeping and reporting burden for the 2016 Rule. The updated 2016 Rule recordkeeping and reporting burden was estimated at a 3-year annual average of 689,154 hours and $110,336,343 (2016$) over the 3-year period. These figures represent the ''baseline'' from which changes made in these final amendments (2020 NSPS Subpart OOOOa Executive Order 13783 Review Final) can be compared. Burden associated with this rule (2020 Rule E.O. 13783 Review Final):

Respondents/affected entities: Oil and natural gas operators and owners.

Respondent's obligation to respond: Mandatory.

Estimated number of respondents: 519.

[88] In a separate action, the EPA is finalizing technical reconsideration amendments to NSPS subpart OOOOa (EPA–HQ–OAR–2017–0483; FRL–10013–60–OAR; FR Doc. 2020–18115). These technical amendments where proposed in October 2018. 83 FR 52056. The information collection burden for the combination of these NSPS subpart OOOOa Reconsideration final amendments and the Policy Review final amendments is addressed in a separate ICR (OMB Control Number 2060–0721; EPA ICR number 2523.04).

Frequency of response: Varies depending on affected facility.[89]

Total estimated burden: 680,841 hours (per year). Burden is defined at 5 CFR 1320.3(b).

Total estimated cost: $108,723,359 (2016$), which includes no capital or O&M costs.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for the EPA's regulations in 40 CFR are listed in 40 CFR part 9. When OMB approves this ICR, the Agency will announce that approval in the **Federal Register** and publish a technical amendment to 40 CFR part 9 to display the OMB control number for the approved information collection activities contained in this final rule.

D. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. In making this determination, the impact of concern is any significant adverse economic impact on small entities. An agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, has no net burden, or otherwise has a positive economic effect on the small entities subject to the rule. This is a deregulatory action, and the burden on all entities affected by this final rule, including small entities, is the same or reduced compared to the 2016 Rule. *See* the discussion in section XI of this preamble and the RIA for details. The EPA has, therefore, concluded that this action will have no net increase regulatory burden for all directly regulated small entities.

E. Unfunded Mandates Reform Act (UMRA)

This action does not contain any unfunded mandate as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. The action imposes no enforceable duty on any state, local, or tribal governments or the private sector.

F. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the National Government and the states, or on the distribution of power and responsibilities among the various levels of government.

G. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications as specified in Executive Order 13175. It will not have substantial direct effects on tribal governments, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes, as specified in Executive Order 13175. Thus, Executive Order 13175 does not apply to this action.

Consistent with the EPA Policy on Consultation and Coordination with Indian Tribes, on September 10, 2019, the EPA sent a letter to all tribal governments inviting consultation. Additionally, on August 29, 2019, and September 18, 2019, the EPA provided an overview of the proposed rule to the National Tribal Air Association. The EPA did not receive any requests for consultation.

H. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866. The 2016 Rule, as discussed in the RIA,[90] was anticipated to reduce emissions of methane, VOC, and HAP, and some of the benefits of reducing these pollutants would have accrued to children. The final rule is expected to decrease the impact of the emissions reductions estimated from the 2016 Rule on these benefits, as discussed in the RIA.

The final action does not affect the level of public health and environmental protection already being provided by existing NAAQS and other mechanisms in the CAA. This final action does not affect applicable local, state, or Federal permitting or air quality management programs that will continue to address areas with degraded air quality and maintain the air quality in areas meeting current standards. Areas that need to reduce criteria air pollution to meet the NAAQS will still need to rely on control strategies to reduce emissions. The EPA does not believe the decrease in emission reductions projected by the final rule will have a disproportionate adverse effect on children's health.

I. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not a ''significant energy action'' because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. In the RIA accompanying the 2016 Rule, the EPA used the NEMS to estimate the impacts of the 2016 Rule on the United States energy system. The EPA estimated small impacts of that rule over the 2020 to 2025 period relative to the baseline for that rule. This final rule is estimated to result in a decrease in total compliance costs, with the reduction in costs affecting a subset of the affected entities under NSPS subpart OOOOa. Therefore, the EPA expects that this deregulatory action will reduce the impacts estimated for the final NSPS in the 2016 RIA and, as such, is not a significant energy action.

J. National Technology Transfer and Advancement Act (NTTAA)

This rulemaking does not involve technical standards.

K. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

The EPA believes that this final action is unlikely to have disproportionately high and adverse human health or environmental effects on minority populations, low-income populations, and/or indigenous peoples, as specified in Executive Order 12898 (59 FR 7629, February 16, 1994). The 2016 Rule was anticipated to reduce emissions of methane, VOC, and HAP, and some of the benefits of reducing these pollutants would have accrued to minority populations, low-income populations, and/or indigenous peoples. The final rule is expected to decrease the impact of the emission reductions estimated from the 2016 Rule on these benefits. These communities may experience forgone benefits as a result of this action, as discussed in the RIA.

This final action does not affect the level of public health and environmental protection already being provided by existing NAAQS and other mechanisms in the CAA. This final action does not affect applicable local, state, or Federal permitting or air quality management programs that will continue to address areas with degraded air quality and maintain the air quality in areas meeting current standards. Areas that need to reduce criteria air pollution to meet the NAAQS will still

[89] The specific frequency for each information collection activity within this request is shown in Tables 1a through 1d of the Supporting Statement in the public docket.

[90] *See* Final RIA in the public docket for this rulemaking.

need to rely on control strategies to reduce emissions.

The EPA believes that this final action is unlikely to have disproportionately high and adverse human health or environmental effects on minority populations, low-income populations, and/or indigenous peoples. The EPA notes that the potential impacts of the final rule are not expected to be experienced uniformly, and the distribution of avoided compliance costs associated with this action depends on the degree to which costs would have been passed through to consumers.

L. Congressional Review Act (CRA)

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2).

List of Subjects in 40 CFR Part 60

Environmental protection, Administrative practice and procedure, Air pollution control, Reporting and recordkeeping requirements.

Andrew Wheeler,

Administrator.

For the reasons set forth in the preamble, the EPA amends 40 CFR part 60 as follows:

PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

■ 1. The authority citation for part 60 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

■ 2. Revise the heading of subpart OOOO to read as follows:

Subpart OOOO—Standards of Performance for Crude Oil and Natural Gas Facilities for Which Construction, Modification, or Reconstruction Commenced After August 23, 2011, and on or Before September 18, 2015

■ 3. Section 60.5360 is amended to read as follows:

§ 60.5360 What is the purpose of this subpart?

This subpart establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO_2) emissions from affected facilities in the crude oil and natural gas production source category that commence construction, modification, or reconstruction after August 23, 2011, and on or before September 18, 2015.

■ 4. Section 60.5365 is amended by revising the introductory text and paragraphs (b), (c), and (d)(1), removing and reserving paragraph (d)(2), and revising paragraph (e) introductory text to read as follows:

§ 60.5365 Am I subject to this subpart?

You are subject to the applicable provisions of this subpart if you are the owner or operator of one or more of the onshore affected facilities listed in paragraphs (a) through (g) of this section that is located within the Crude Oil and Natural Gas Production source category, as defined in § 60.5430 for which you commence construction, modification, or reconstruction after August 23, 2011, and on or before September 18, 2015.

* * * * *

(b) Each centrifugal compressor affected facility, which is a single centrifugal compressor using wet seals. A centrifugal compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

(c) Each reciprocating compressor affected facility, which is a single reciprocating compressor. A reciprocating compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

(d)(1) For the oil and natural gas production segment, each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 standard cubic feet per hour.

* * * * *

(e) Each storage vessel affected facility, which is a single storage vessel, and has the potential for VOC emissions equal to or greater than 6 tons per year (tpy) as determined according to this section by October 15, 2013, for Group 1 storage vessels and by April 15, 2014, or 30 days after startup (whichever is later) for Group 2 storage vessels, except as provided in paragraphs (e)(1) through (4) of this section. The potential for VOC emissions must be calculated using a generally accepted model or calculation methodology, based on the maximum average daily throughput determined for a 30-day period of production prior to the applicable emission determination deadline specified in this section. The determination may take into account requirements under a legally and practically enforceable limit in an operating permit or other requirement established under a Federal, State, local or tribal authority.

* * * * *

■ 5. Section 60.5420 is amended by revising paragraph (c)(5)(iv) to read as follows:

§ 60.5420 What are my notification, reporting, and recordkeeping requirements?

* * * * *

(c) * * *

(5) * * *

(iv) For storage vessels that are skid-mounted or permanently attached to something that is mobile (such as trucks, railcars, barges, or ships), records indicating the number of consecutive days that the vessel is located at the site. If a storage vessel is removed from the site and, within 30 days, is either returned to or replaced by another storage vessel at the site to serve the same or similar function, then the entire period since the original storage vessel was first located at the site, including the days when the storage vessel was removed, will be added to the count towards the number of consecutive days.

* * * * *

■ 6. Section 60.5430 is amended by:

■ a. Adding the definition for *Crude Oil and Natural Gas Production source category* in alphabetical order.

■ b. Revising the definition of *Custody transfer.*

■ c. Adding the definitions for *Local distribution company (LDC) custody transfer station* and *Natural gas transmission and storage segment* in alphabetical order.

The additions and revision read as follows:

§ 60.5430 What definitions apply to this subpart?

* * * * *

Crude Oil and Natural Gas Production source category means:

(1) Crude oil production, which includes the well and extends to the point of custody transfer to the crude oil transmission pipeline or any other forms of transportation; and

(2) Natural gas production and processing, which includes the well and extends to, but does not include, the point of custody transfer to the natural gas transmission and storage segment.

Custody transfer means the transfer of crude oil or natural gas after processing and/or treatment in the producing operations, or from storage vessels or automatic transfer facilities or other such equipment, including product loading racks, to pipelines or any other forms of transportation.

* * * * *

Local distribution company (LDC) custody transfer station means a metering station where the LDC receives a natural gas supply from an upstream supplier, which may be an interstate transmission pipeline or a local natural gas producer, for delivery to customers through the LDC's intrastate transmission or distribution lines.

* * * * *

Natural gas transmission and storage segment means the transport or storage of natural gas prior to delivery to a ''local distribution company custody transfer station'' (as defined in this section) or to a final end user (if there is no local distribution company custody transfer station). For the purposes of this subpart, natural gas enters the natural gas transmission and storage segment after the natural gas processing plant, when present. If no natural gas processing plant is present, natural gas enters the natural gas transmission and storage segment after the point of ''custody transfer'' (as defined in this section). A compressor station that transports natural gas prior to the point of ''custody transfer'' or to a natural gas processing plant (if present) is not considered a part of the natural gas transmission and storage segment.

* * * * *

Subpart OOOOa—Standards of Performance for Crude Oil and Natural Gas Facilities for Which Construction, Modification, or Reconstruction Commenced After September 18, 2015

■ 7. Section 60.5360a is revised to read as follows:

§ 60.5360a What is the purpose of this subpart?

(a) This subpart establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO_2) emissions from affected facilities in the Crude Oil and Natural Gas Production source category that commence construction, modification, or reconstruction after September 18, 2015. The effective date of the rule in this subpart is August 2, 2016.

(b) [Reserved]

■ 8. Section 60.5365a is amended by revising the introductory text to read as follows:

§ 60.5365a Am I subject to this subpart?

You are subject to the applicable provisions of this subpart if you are the owner or operator of one or more of the onshore affected facilities listed in paragraphs (a) through (j) of this section, that is located within the Crude Oil and Natural Gas Production source category, as defined in § 60.5430a, for which you commence construction, modification, or reconstruction after September 18, 2015.

* * * * *

■ 9. Section 60.5375a is amended by revising the section heading and introductory text to read as follows:

§ 60.5375a What VOC standards apply to well affected facilities?

If you are the owner or operator of a well affected facility as described in § 60.5365a(a) that also meets the criteria for a well affected facility in § 60.5365(a) (in subpart OOOO of this part), you must reduce VOC emissions by complying with paragraphs (a) through (g) of this section. If you own or operate a well affected facility as described in § 60.5365a(a) that does not meet the criteria for a well affected facility in § 60.5365(a) (in subpart OOOO of this part), you must reduce VOC emissions by complying with paragraphs (f)(3) and (4) or paragraph (g) of this section for each well completion operation with hydraulic fracturing prior to November 30, 2016, and you must comply with paragraphs (a) through (g) of this section for each well completion operation with hydraulic fracturing on or after November 30, 2016.

* * * * *

■ 10. Section 60.5380a is amended by revising the section heading, introductory text, and paragraph (a)(1) to read as follows:

§ 60.5380a What VOC standards apply to centrifugal compressor affected facilities?

You must comply with the VOC standards in paragraphs (a) through (d) of this section for each centrifugal compressor affected facility.

(a)(1) You must reduce VOC emissions from each centrifugal compressor wet seal fluid degassing system by 95.0 percent.

* * * * *

■ 11. Section 60.5385a is amended by revising the section heading, introductory text, and paragraph (a)(3) to read as follows:

§ 60.5385a What VOC standards apply to reciprocating compressor affected facilities?

You must reduce VOC emissions by complying with the standards in paragraphs (a) through (d) of this section for each reciprocating compressor affected facility.

(a) * * *

(3) Collect the VOC emissions from the rod packing using a rod packing emissions collection system that operates under negative pressure and route the rod packing emissions to a process through a closed vent system that meets the requirements of § 60.5411a(a) and (d).

* * * * *

■ 12. Section 60.5390a is amended by revising the section heading and introductory text to read as follows:

§ 60.5390a What VOC standards apply to pneumatic controller affected facilities?

For each pneumatic controller affected facility you must comply with the VOC standards, based on natural gas as a surrogate for VOC, in either paragraph (b)(1) or (c)(1) of this section, as applicable. Pneumatic controllers meeting the conditions in paragraph (a) of this section are exempt from the requirements in paragraph (b)(1) or (c)(1) of this section.

* * * * *

■ 13. Section 60.5393a is amended by revising the section heading and introductory text to read as follows:

§ 60.5393a What VOC standards apply to pneumatic pump affected facilities?

For each pneumatic pump affected facility you must comply with the VOC standards, based on natural gas as a surrogate for VOC, in either paragraph (a) or (b) of this section, as applicable, on or after November 30, 2016.

* * * * *

■ 14. Section 60.5397a is amended by revising the section heading and introductory text to read as follows:

§ 60.5397a What fugitive emissions VOC standards apply to the affected facility which is the collection of fugitive emissions components at a well site and the affected facility which is the collection of fugitive emissions components at a compressor station?

For each affected facility under § 60.5365a(i) and (j), you must reduce VOC emissions by complying with the requirements of paragraphs (a) through (j) of this section. The requirements in this section are independent of the closed vent system and cover requirements in § 60.5411a.

* * * * *

■ 15. Section 60.5398a is amended by revising the section heading and paragraphs (a) and (d)(1)(xi) to read as follows:

§ 60.5398a What are the alternative means of emission limitations for VOC from well completions, reciprocating compressors, the collection of fugitive emissions components at a well site and the collection of fugitive emissions components at a compressor station?

(a) If, in the Administrator's judgment, an alternative means of emission limitation will achieve a reduction in VOC emissions at least equivalent to the reduction in VOC emissions achieved under §§ 60.5375a, 60.5385a, and 60.5397a, the Administrator will publish, in the **Federal Register**, a notice permitting the use of that alternative means for the purpose of compliance with §§ 60.5375a, 60.5385a, and 60.5397a. The notice may condition permission on requirements related to the operation and maintenance of the alternative means.

* * * * *

(d) * * *

(1) * * *

(xi) Operation and maintenance procedures and other provisions necessary to ensure reduction in VOC emissions at least equivalent to the reduction in VOC emissions achieved under § 60.5397a.

* * * * *

■ 16. Section 60.5400a is amended by revising the section heading and paragraph (c) to read as follows:

§ 60.5400a What equipment leak VOC standards apply to affected facilities at an onshore natural gas processing plant?

* * * * *

(c) You may apply to the Administrator for permission to use an alternative means of emission limitation that achieves a reduction in emissions of VOC at least equivalent to that achieved by the controls required in this subpart according to the requirements of § 60.5402a.

* * * * *

■ 17. Section 60.5401a is amended by revising the section heading to read as follows:

§ 60.5401a What are the exceptions to the equipment leak VOC standards for affected facilities at onshore natural gas processing plants?

* * * * *

■ 18. Section 60.5402a is amended by revising the section heading and paragraphs (a) and (d)(2) introductory text to read as follows:

§ 60.5402a What are the alternative means of emission limitations for VOC equipment leaks from onshore natural gas processing plants?

(a) If, in the Administrator's judgment, an alternative means of emission limitation will achieve a reduction in VOC emissions at least equivalent to the reduction in VOC emissions achieved under any design, equipment, work practice or operational standard, the Administrator will publish, in the **Federal Register**, a notice permitting the use of that alternative means for the purpose of compliance with that standard. The notice may condition permission on requirements related to the operation and maintenance of the alternative means.

* * * * *

(d) * * *

(2) The application must include operation, maintenance, and other provisions necessary to assure reduction in VOC emissions at least equivalent to the reduction in VOC emissions achieved under the design, equipment, work practice or operational standard in paragraph (a) of this section by including the information specified in paragraphs (d)(2)(i) through (x) of this section.

* * * * *

■ 19. Section 60.5410a is amended by revising paragraphs (a) introductory text, (b)(1), (d) introductory text, and (f) to read as follows:

§ 60.5410a How do I demonstrate initial compliance with the standards for my well, centrifugal compressor, reciprocating compressor, pneumatic controller, pneumatic pump, storage vessel, collection of fugitive emissions components at a well site, collection of fugitive emissions components at a compressor station, and equipment leaks and sweetening unit affected facilities at onshore natural gas processing plants?

* * * * *

(a) To achieve initial compliance with the VOC standards for each well completion operation conducted at your well affected facility you must comply with paragraphs (a)(1) through (4) of this section.

* * * * *

(b)(1) To achieve initial compliance with standards for your centrifugal compressor affected facility you must reduce VOC emissions from each centrifugal compressor wet seal fluid degassing system by 95.0 percent or greater as required by § 60.5380a(a) and as demonstrated by the requirements of § 60.5413a.

* * * * *

(d) To achieve initial compliance with VOC emission standards for your pneumatic controller affected facility you must comply with the requirements specified in paragraphs (d)(1) through (6) of this section, as applicable.

* * * * *

(f) For affected facilities at onshore natural gas processing plants, initial compliance with the VOC standards is demonstrated if you are in compliance with the requirements of § 60.5400a.

* * * * *

■ 20. Section 60.5412a is amended by paragraphs (a)(1)(i) and (a)(2) to read as follows:

§ 60.5412a What additional requirements must I meet for determining initial compliance with control devices used to comply with the emission standards for my centrifugal compressor, and storage vessel affected facilities?

* * * * *

(a) * * *

(1) * * *

(i) You must reduce the mass content of VOC in the gases vented to the device by 95.0 percent by weight or greater as determined in accordance with the requirements of § 60.5413a(b), with the exceptions noted in § 60.5413a(a).

* * * * *

(2) Each vapor recovery device (*e.g.,* carbon adsorption system or condenser) or other non-destructive control device must be designed and operated to reduce the mass content of VOC in the gases vented to the device by 95.0 percent by weight or greater as determined in accordance with the requirements of § 60.5413a(b). As an alternative to the performance testing requirements in § 60.5413a(b), you may demonstrate initial compliance by conducting a design analysis for vapor recovery devices according to the requirements of § 60.5413a(c).

* * * * *

■ 21. Section 60.5413a is amended by revising paragraph (d)(11)(iii) to read as follows:

§ 60.5413a What are the performance testing procedures for control devices used to demonstrate compliance at my centrifugal compressor and storage vessel affected facilities?

* * * * *

(d) * * *

(11) * * *

(iii) A manufacturer must demonstrate a destruction efficiency of at least 95 percent for THC, as propane. A control device model that demonstrates a destruction efficiency of 95 percent for THC, as propane, will meet the control requirement for 95-percent destruction of VOC (if applicable) required under this subpart.

* * * * *

■ 22. Section 60.5415a is amended by revising paragraphs (b)(1) and (f) to read as follows:

§ 60.5415a How do I demonstrate continuous compliance with the standards for my well, centrifugal compressor, reciprocating compressor, pneumatic controller, pneumatic pump, storage vessel, collection of fugitive emissions components at a well site, and collection of fugitive emissions components at a compressor station affected facilities, and affected facilities at onshore natural gas processing plants?

* * * * *

(b) * * *

(1) You must reduce VOC emissions from the wet seal fluid degassing system by 95.0 percent or greater.

* * * * *

(f) For affected facilities at onshore natural gas processing plants, continuous compliance with VOC requirements is demonstrated if you are in compliance with the requirements of § 60.5400a.

* * * * *

■ 23. Section 60.5420a is amended by revising paragraph (c)(5)(iv) to read as follows:

§ 60.5420a What are my notification, reporting, and recordkeeping requirements?

* * * * *

(c) * * *

(5) * * *

(iv) For storage vessels that are skid-mounted or permanently attached to something that is mobile (such as trucks, railcars, barges, or ships), records indicating the number of consecutive days that the vessel is located at a site in the Crude Oil and Natural Gas source category. If a storage vessel is removed from a site and, within 30 days, is either returned to the site or replaced by another storage vessel at the site to serve the same or similar function, then the entire period since the original storage vessel was first located at the site, including the days when the storage vessel was removed, will be added to the count towards the number of consecutive days.

* * * * *

■ 24. Section 60.5421a is amended by revising the section heading to read as follows:

§ 60.5421a What are my additional recordkeeping requirements for my affected facility subject to VOC requirements for onshore natural gas processing plants?

* * * * *

■ 25. Section 60.5422a is amended by revising the section heading to read as follows:

§ 60.5422a What are my additional reporting requirements for my affected facility subject to VOC requirements for onshore natural gas processing plants?

* * * * *

■ 26. Section 60.5430a is amended by:

■ a. Revising the definition for *Compressor station.*

■ b. Removing the definition for *Crude oil and natural gas source category.*

■ c. Adding the definition for *Crude Oil and Natural Gas Production source category* in alphabetical order.

■ d. Revising the definitions for *Equipment* and *Fugitive emissions component.*

■ e. Adding the definition for *Natural gas transmission and storage segment* in alphabetical order.

The revisions and additions read as follows:

§ 60.5430a What definitions apply to this subpart?

* * * * *

Compressor station means any permanent combination of one or more compressors that move natural gas at increased pressure through gathering pipelines. This includes, but is not limited to, gathering and boosting stations. The combination of one or more compressors located at a well site, or located at an onshore natural gas processing plant, is not a compressor station for purposes of § 60.5397a.

* * * * *

Crude Oil and Natural Gas Production source category means:

(1) Crude oil production, which includes the well and extends to the point of custody transfer to the crude oil transmission pipeline or any other forms of transportation; and

(2) Natural gas production and processing, which includes the well and extends to, but does not include, the point of custody transfer to the natural gas transmission and storage segment.

* * * * *

Equipment, as used in the standards and requirements in this subpart relative to the equipment leaks of VOC from onshore natural gas processing plants, means each pump, pressure relief device, open-ended valve or line, valve, and flange or other connector that is in VOC service or in wet gas service, and any device or system required by those same standards and requirements in this subpart.

* * * * *

Fugitive emissions component means any component that has the potential to emit fugitive emissions of VOC at a well site or compressor station, including valves, connectors, pressure relief devices, open-ended lines, flanges, covers, and closed vent systems not subject to § 60.5411 or § 60.5411a, thief hatches or other openings on a controlled storage vessel not subject to § 60.5395 or § 60.5395a, compressors, instruments, and meters. Devices that vent as part of normal operations, such as natural gas-driven pneumatic controllers or natural gas-driven pumps, are not fugitive emissions components, insofar as the natural gas discharged from the device's vent is not considered a fugitive emission. Emissions originating from other than the device's vent, such as the thief hatch on a controlled storage vessel, would be considered fugitive emissions.

* * * * *

Natural gas transmission and storage segment means the transport or storage of natural gas prior to delivery to a ''local distribution company custody transfer station'' (as defined in this section) or to a final end user (if there is no local distribution company custody transfer station). For the purposes of this subpart, natural gas enters the natural gas transmission and storage segment after the natural gas processing plant, when present. If no natural gas processing plant is present, natural gas enters the natural gas transmission and storage segment after the point of ''custody transfer'' (as defined in this section). A compressor station that transports natural gas prior to the point of ''custody transfer'' or to a natural gas processing plant (if present) is not considered a part of the natural gas transmission and storage segment.

* * * * *

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Regulatory Impact Analysis for the Review and Reconsideration of the Oil and Natural Gas Sector Emission Standards for New, Reconstructed, and Modified Sources

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Regulatory Impact Analysis for the Review and Reconsideration of the Oil and Natural Gas Sector Emission Standards for New, Reconstructed, and Modified Sources

U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Health and Environmental Impacts Division
Research Triangle Park, NC

CONTACT INFORMATION

This document has been prepared by staff from the Office of Air and Radiation, U.S. Environmental Protection Agency. Questions related to this document should be addressed to Alexander Macpherson, U.S. Environmental Protection Agency, Office of Air and Radiation, Research Triangle Park, North Carolina 27711 (email: macpherson.alex@epa.gov).

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1 EXECUTIVE SUMMARY

1.1 Introduction

This regulatory analysis accompanies the final review and reconsideration of the new source performance standards (NSPS) at 40 Code of Federal Regulations (CFR) part 60, subpart OOOO (2012 NSPS OOOO) and OOOOa (2016 NSPS OOOOa). The Environmental Protection Agency (EPA) is finalizing two simultaneous actions that amend the requirements of the 2012 NSPS OOOO and 2016 NSPS OOOOa. This document presents regulatory impact analyses (RIAs) for both actions separately and presents the combined impacts of the two actions.

Policy Review: The first RIA in this document presents the regulatory impacts of the final amendments to the 2012 NSPS OOOO and 2016 NSPS OOOOa. These amendments, which we refer to in this document as the "Policy Review," remove sources in the transmission and storage segment from the source category, rescind the NSPS (including both the volatile organic compounds and GHG requirements in form of limitations on methane) applicable to those sources, and rescind the methane-specific requirements of the NSPS applicable to sources in the production and processing segments.

Technical Reconsideration: The second RIA in this document presents the regulatory impacts of the finalized set of amendments pertaining to several technical aspects of the 2016 NSPS OOOOa, which we refer to in this document at the "Technical Reconsideration." The EPA finalized amendments to the fugitive emissions requirements, well site pneumatic pump standards, requirements for certification of closed vent systems (CVS) by a professional engineer, and alternative fugitive emissions standards for several state programs. The Technical Reconsideration also includes other amendments, though the impacts of these other amendments are not presented in this document for reasons discussed below and in Chapter 3. These other amendments address issues raised in the reconsideration petitions for the oil and natural gas NSPS, as well as streamline the implementation of the rule. The Technical Reconsideration also includes technical corrections and additional clarifying language in the regulatory text and/or preamble where the EPA concluded that further clarification was warranted.

The impacts of regulatory actions are evaluated relative to a baseline that represents the world without the regulatory action. Because the preambles and amended regulatory text for the two actions are sequenced, starting with the Policy Review, we evaluate the regulatory impacts of the actions within this document using the same sequence. The Policy Review removes sources in the transmission and storage segment from the source category, so these sources are not affected by the Technical Reconsideration, and therefore not in the baseline used to estimate impacts of the Technical Reconsideration.

To better inform the public on the aggregate regulatory impacts of the two final actions, we follow the two RIAs with an analysis that combines the regulatory impacts of the two actions relative to a baseline representing the regulatory landscape in the absence of either action, *i.e.*, the same baseline used in the Policy Review analysis. Throughout this document, we focus the analysis on the final amendments that result in quantifiable compliance cost or emissions changes compared to the relevant baseline. We do not analyze the regulatory impacts of all amendments because we either do not have sufficient data or because it is assumed the provisions would not result in compliance cost or emissions impacts; in these instances, we qualitatively discuss the amendments.

Compared to the analysis presented in the 2016 NSPS RIA, this analysis reflects updated assumptions based on new information on existing and projected source counts, model plant emissions and control costs, natural gas prices, and state and local regulations that have been promulgated since the 2016 NSPS OOOOa was finalized. Additional updates reflect information received during the comment period of the Technical Reconsideration.[1] Aside from these updates, which are described in detail in Sections 2.1 and 3.1, the same assumptions and methods used in the 2016 NSPS RIA were used in this analysis to estimate an updated baseline. The updated baseline represents the EPA's best assessment of the current and future state of the industry absent the changes finalized under the Policy Review and Technical Reconsideration.

[1] See the preamble for the Technical Reconsideration and its response to comments document, which are available in the docket.

1.2 Summary of Results

Table 1-1 presents the present value (PV) and equivalent annual value (EAV), estimated using discount rates of 7 and 3 percent, of the changes in quantified benefits, costs, and net benefits, as well as the forgone emissions reductions relative to the baseline due to the Policy Review. These values reflect a 2021 through 2030 analysis period, discounted to 2020, and are presented in 2016 dollars. When discussing net benefits, we refer to the cost reductions as the "benefits" of the final actions and the forgone benefits as the "costs" of the final actions. The net benefits are the benefits (cost reductions) minus the costs (forgone benefits). All costs and benefits presented in Table 1-1 are estimated relative to a baseline without the Policy Review or Technical Reconsideration. Table 1-2 presents the PV and EAV for the Technical Reconsideration, which includes the final amendments of the Policy Review in the baseline. Table 1-3 presents the combined results of the Policy Review and Technical Reconsideration, compared to a baseline without either of the two final rules, which is equivalent to summing the results in Table 1-2 and Table 1-3.

Table 1-1 Compliance Cost Reductions, Forgone Benefits, and Forgone Emissions Reductions of the Policy Review, 2021 through 2030 (millions 2016$)

	7% Discount Rate		3% Discount Rate	
	Present Value	**Equivalent Annualized Value**	**Present Value**	**Equivalent Annualized Value**
Benefits (Total Cost Reductions)	$31	$4.1	$38	$4.3
Cost Reductions	$67	$8.9	$83	$9.4
Forgone Value of Product Recovery	$36	$4.7	$45	$5.1
Costs (Forgone Domestic Climate Benefits)[1]	$17	$2.2	$63	$7.2
Net Benefits	$14	$1.9	-$25	-$2.9
Forgone Emissions Reductions	**2021-2030 Total**			
Methane (short tons)	400,000			
VOC	11,000			
HAP	330			
Methane (million metric tons CO_2 Eq.)	9			

Note: Estimates may not sum due to independent rounding.
[1] The forgone benefits estimates are calculated using estimates of the social cost of methane (SC-CH_4). SC-CH_4 values represent only a partial accounting of domestic climate impacts from methane emissions. While we expect that the forgone VOC and HAP emissions reductions may also degrade air quality and adversely affect health and welfare, data limitations prevent us from quantifying and monetizing these effects.

Table 1-2 Compliance Cost Reductions, Forgone Benefits, and Forgone Emissions Reductions of the Technical Reconsideration, 2021 through 2030 (millions 2016$)

	7% Discount Rate		3% Discount Rate	
	Present Value	**Equivalent Annualized Value**	**Present Value**	**Equivalent Annualized Value**
Benefits (Total Cost Reductions)	$750	$100	$950	$110
Cost Reductions	$800	$110	$1,000	$110
Forgone Value of Product Recovery	$44	$5.9	$57	$6.5
Costs (Forgone Domestic Climate Benefits)[1]	$19	$2.5	$71	$8.1
Net Benefits	$730	$97	$880	$100
Forgone Emissions Reductions	**2021-2030 Total**			
Methane (short tons)	450,000			
VOC	120,000			
HAP	4,700			
Methane (million metric tons CO_2 Eq.)	10			

Note: Estimates may not sum due to independent rounding.
[1] The forgone benefits estimates are calculated using estimates of the social cost of methane (SC-CH_4). SC-CH_4 values represent only a partial accounting of domestic climate impacts from methane emissions. While we expect that the forgone VOC and HAP emissions reductions may also degrade air quality and adversely affect health and welfare, data limitations prevent us from quantifying and monetizing these effects.

Table 1-3 Compliance Cost Reductions, Forgone Benefits, and Forgone Emissions Reductions of the Combined Policy Review and Technical Reconsideration, 2021 through 2030 (millions 2016$)

	7% Discount Rate		3% Discount Rate	
	Present Value	**Equivalent Annualized Value**	**Present Value**	**Equivalent Annualized Value**
Benefits (Total Cost Reductions)	$780	$100	$990	$110
Cost Reductions	$860	$110	$1,100	$120
Forgone Value of Product Recovery	$80	$11	$100	$12
Costs (Forgone Domestic Climate Benefits)[1]	$35	$4.7	$130	$15
Net Benefits	$750	$99	$850	$97
Forgone Emissions Reductions	**2021-2030 Total**			
Methane (short tons)	850,000			
VOC	140,000			
HAP	5,000			
Methane (million metric tons CO_2 Eq.)	19			

Note: Estimates may not sum due to independent rounding.
[1] The forgone benefits estimates are calculated using estimates of the social cost of methane (SC-CH_4). SC-CH_4 values represent only a partial accounting of domestic climate impacts from methane emissions. While we expect that the forgone VOC and HAP emissions reductions may also degrade air quality and adversely affect health and welfare, data limitations prevent us from quantifying and monetizing these effects.

Beyond the top-level cost and benefit information presented in Tables 1-1 through 1-3, there may be other economic impacts resulting from the final Policy Review and the final Technical Reconsideration. Under both actions individually and combined, we expect reductions in the small (less than 1 percent) impacts on energy production and markets estimated for the final NSPS in the 2016 NSPS RIA. While we did not conduct quantitative distributional impacts analyses of the rules, we do not expect the cost reductions to be distributed evenly across affected entities, and we do not expect the forgone benefits resulting from the finalized actions to be distributed uniformly across the U.S. Since these final actions are deregulatory, we concluded that they will relieve regulatory burden for small (and non-small) entities subject to the reconsidered provisions, and thus will not have a significant impact on a substantial number of small entities (SISNOSE). Finally, we expect reductions in labor associated with compliance-related activities due to the Policy Review and Technical Reconsideration; however, we did not quantify broader labor impacts on the industry or other sectors of the economy.

1.3 Organization of this Document

Chapters 2, 3, and 4 present the results of this RIA for the Policy Review, Technical Reconsideration, and Full Review and Reconsideration (*i.e.*, combined actions), respectively. Each of these chapters describes the emissions, compliance cost, and forgone benefits analysis of the final actions relative to their respective baselines, as well as their economic impacts. The analyses use similar methods to those used in the 2016 NSPS RIA.[2] The remainder of this report describes this methodology, with explanations of the instances in which the underlying data, assumptions, or methods changed from the 2016 NSPS RIA. The bulk of the supporting technical details which apply to all three analyses are presented in Chapter 2, with Chapters 3 and 4 referring to Chapter 2 rather than repeating those details.

[2] Found at: https://www3.epa.gov/ttn/ecas/docs/ria/oilgas_ria_nsps_final_2016-05.pdf.

2 REGULATORY IMPACT ANALYSIS FOR THE OIL AND NATURAL GAS SECTOR: EMISSION STANDARDS FOR NEW, RECONSTRUCTED, AND MODIFIED SOURCES REVIEW

2.1 Introduction

This final action (called the "Policy Review" in this document) rescinds the requirements of the subpart OOOO (2012 NSPS OOOO) and OOOOa (2016 NSPS OOOOa) for oil and natural gas sources in the transmission and storage segment. The Policy Review also rescinds the methane standards for sources in the production and processing segments, while leaving VOC requirements in place for production and processing sources. The EPA has determined in this final action that the methane control options are the same as VOC control options, and thus the methane standard is redundant. As such, there are no expected cost or emissions impacts from removing the methane requirements for potential new, reconstructed, and modified sources in the production and processing segments.

In this RIA, we present estimated benefits and costs of the final Policy Review action. A more detailed description of the regulatory baseline is below. We project impacts for the years 2021 through 2030. All monetized impacts of these changes are presented in 2016 dollars. This analysis also presents benefits and costs in a present value (PV) framework. All sources in the transmission and storage segment that are affected by subparts OOOO and OOOOa (hereafter referred to as "the NSPS") are impacted by this final deregulatory action if they would have been affected by the NSPS in the baseline.

The regulatory impacts of this action pertain specifically to potential new, reconstructed, and modified sources under the NSPS. The EPA recognizes that by rescinding the applicability of the NSPS for methane, issued under CAA section 111(b), existing sources in the source category will not be subject to regulation under CAA section 111(d). Analysis of potential impacts of removing the requirement to regulate existing sources under 111(d) is outside the scope of this RIA.

2.1.1 Summary of Changes Since the Final 2016 NSPS RIA

2.1.1.1 Updated Information

This analysis uses the same methodologies as the 2016 NSPS RIA but changes some assumptions based on updated data. The following list highlights the updates and revisions made to the methodology since the 2016 NSPS RIA:

- **Annual Energy Outlook:** For the 2016 NSPS RIA, we used the 2015 Annual Energy Outlook (AEO). For this analysis, we use the AEO2020, published in January 2020.[3] The natural gas price projections are used to estimate the value of product recovery. The use of the AEO2020 for the final rule is also an update from the RIA associated with the proposal of this action, which used the AEO2018. The projections of Henry Hub natural gas prices in AEO2020 are lower than the AEO2015 projections used in the 2016 RIA.
- **Source Projections:** Since the promulgation of the 2016 NSPS OOOOa, the U.S. Greenhouse Gas Inventory (GHGI) has been updated.[4] The data from the updated GHGI were used to project the number of NSPS-affected compressor stations, reciprocating compressors, and pneumatic controllers over time. Compared to the 2016 NSPS RIA, the projected number of NSPS-affected compressor stations, reciprocating compressors, and pneumatic controllers in the transmission and storage segment increased. For centrifugal compressors and storage vessels, we relied on information from the 2016 NSPS OOOOa rule compliance reports received in 2018 and determined that there are unlikely to be new centrifugal compressors and storage vessels constructed in the future in the transmission and storage segment.
- **Social Cost of Methane:** In the 2016 NSPS OOOOa, the EPA used an estimate of the global social cost of methane to monetize the climate related benefits associated with reductions in methane emissions. Since the promulgation of the 2016 NSPS OOOOa, Executive Order (E.O.) 13783 has been signed, which directs agencies to ensure that estimates of the social cost of greenhouse gases used in economic analyses are consistent with the guidance contained in the Office of Management and Budget (OMB) Circular A-4, "including with respect to the consideration of domestic versus international impacts and the consideration of appropriate discount rates" (E.O. 13783, Section 5(c)). Thus, for this action, we use an interim estimate of the domestic social cost of methane to estimate the forgone climate benefits resulting from the forgone methane emissions reductions due to this final action.
- **Model Plants:** The costs of the fugitive emissions monitoring requirements promulgated in 2016 for transmission and storage compressor stations have been updated. Specifically, the estimate of upfront costs of the fugitive monitoring program have increased while the annual cost estimates have decreased.[5]

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[3] AEO2020 can be found at https://www.eia.gov/outlooks/aeo/. Accessed April 26, 2020.

[4] The updated GHGI data used is from the April 2018 release. For information on the inventory, visit https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks/. Accessed April 26, 2020.

[5] For more information on the model plants, see the docketed memorandum titled: U.S. EPA. 2020. Memorandum: Control Cost and Emission Changes under the Final Amendments to 40 CFR Part 60, subpart OOOOa Under Executive Order 13783.

- **Other**: In the 2016 NSPS OOOOa, all dollar figures were presented in 2012 dollars. In this analysis, all estimated impacts are presented in 2016 dollars.[6] In the 2016 NSPS RIA, we presented impacts for the snapshot years of 2020 and 2025. For this analysis, we estimate cost reductions and emissions changes resulting from changes in compliance activities projected to occur in each year from 2021 through 2030 due to this final action. We discount the annual cost reductions to 2020 and present total PV and equivalent annualized value (EAV) over the analysis period.[7]

Note that, although there are states with similar requirements for transmission and storage sources as the NSPS, we are unable to account for these requirements in the evaluation of this action.[8]

2.1.1.2 Updated Baseline for the Policy Review

Table 2-1 shows the projected number of NSPS-affected facilities, methane, VOC, and HAP emission reductions, and the total annualized costs including the value of product recovery in 2021 and 2025 for the sources in the transmission and storage segment as estimated in the 2016 NSPS RIA and relative to the baseline used for this action. Based on updated facility projections,[9] there may be more affected facilities than anticipated in the 2016 NSPS RIA.[10] Consequently, for the subset of 2016 NSPS provisions affected by the Policy Review, compliance cost and emissions impacts of the 2016 NSPS were likely underestimated in the 2016 analysis. The emission reductions presented here are the emission reductions assuming the affected sources were not performing compliance activities prior to the 2016 NSPS OOOOa.

[6] Costs were adjusted to 2016 dollars using the seasonally adjusted annual Gross Domestic Product: Implicit Price Deflator updated by the Federal Reserve on April 13, 2020.

[7] The proposal RIA discounted to 2016. In this RIA, we discount to 2020 to improve interpretability.

[8] For the Policy Review and for the Technical Reconsideration, the EPA projected affected facilities using a combination of historical data from the U.S. GHG Inventory, DI Desktop, EPA compliance reports, and projected activity levels taken from the AEO. Because oil and natural gas well locations are identified in DI Desktop, we can forecast well drilling activities by state. As a result, we can estimate the effects of state regulations on future affected facilities that draw upon state-specific information. However, projections of affected facilities that draw upon the GHGI, such as sources in the transmission and storage segment, are national-scale and, hence, we are unable to account for state-level regulations in our analysis.

[9] See Section 2.3 and Appendix A for details on facility projections.

[10] Results from the 2016 NSPS RIA are generally not comparable to results in this analysis because of changes to the baseline. The higher count of affected facilities in transmission and storage results from higher growth in the historical period used to estimate new facilities compared to the historical data used in 2016, which showed little growth in transmission and storage. Affected facility counts in transmission and storage are sensitive to the historical data used. Changes in transmission and storage-related methane, VOC, and HAP emissions compared to the 2016 baseline shown in Table 2-1 result from changes in the projected facility counts as the source-level emissions characteristics are the same as in the 2016 analysis.

Table 2-1 Projected Impacts of the 2016 NSPS OOOOa Transmission and Storage Requirements: 2016 NSPS RIA and Updated Baseline Comparison[1]

	2016 NSPS RIA		Updated Baseline	
	2021[2]	2025	2021	2025
Counts of NSPS-Affected Sources in Transmission and Storage	970	1,500	3,000	4,600
Methane Emission Reductions (short tons)	12,000	20,000	27,000	43,000
VOC Emission Reductions (tons)	340	540	760	1,200
Total Annualized Compliance cost, without Product Recovery (7%, millions, 2016$)[3]	$3.7	$5.8	$6.0	$9.5
Total Annualized Compliance cost, with Product Recovery (7%, millions, 2016$)[3]	$1.1	$1.8	$2.9	$3.9

1 The emission reductions presented here are the emission reductions assuming the affected sources were not performing compliance activities prior to the 2016 NSPS OOOOa.
[2] While the 2016 NSPS RIA only summarized results for 2020 and 2025, we used the same underlying data described in the 2016 NSPS TSD to estimate impacts for 2021.
[3] Excluding compliance cost of professional engineer certification, as well as other provisions in the 2016 NSPS OOOOa unrelated to fugitive emissions monitoring requirements.

2.1.2 Rescinded Regulatory Requirements

The projected compliance cost reductions and forgone emission reductions from rescinding the NSPS requirements for transmission and storage sources are equal to the cost and emissions impacts that would have resulted from keeping the 2016 requirements in place after accounting for the updates described in the preceding section. The universe of affected sources includes all sources in the transmission and storage segment that would be considered new or modified under the oil and natural gas NSPS and would be complying with the rule in absence of this action.

For example, compressor stations in the transmission sector that become NSPS-affected sources in 2016 are also affected by this action because they are expected to cease NSPS-required activities related to the fugitive emissions monitoring and repair requirements. However, compressor stations in the gathering and boosting sector are not affected by this action because they are in the production and processing segment, which is still required to comply with quarterly fugitive emissions monitoring and repair requirements. Table 2-2 summarizes the sources affected by this action and their respective regulatory requirements in the baseline.

We estimate that there are no affected centrifugal compressors and storage vessels in the transmission and storage segment, so we do not anticipate any regulatory impacts associated with the Policy Review on these sources. Similarly, we do not currently have the necessary data to estimate the effects of the Policy Review on compressor stations on the Alaska North Slope.

Table 2-2 Emissions Sources and Baseline Requirements in the Transmission and Storage Segment

Emissions Point and Control	Requirements in the Baseline
Fugitive Emissions - Planning, Monitoring and Maintenance	
Compressor Stations	Quarterly monitoring
Compressor Stations on Alaska North Slope[1]	Annual monitoring
Pneumatic Controllers	Replace high-bleed with low-bleed
Reciprocating Compressors	Replace rod packing every 26,000 hours[2]
Centrifugal Compressors[3]	Route to control
Storage Vessels[3]	Storage vessels with VOC emissions of 6 tons a year or more must reduce VOC emissions by at least 95 percent

[1] We do not currently have data to estimate the effects of the Policy Review on compressor stations on the Alaska North Slope.
[2] Operators have a choice to replace rod packings either every 36 months or 26,000 hours. As in the 2016 NSPS TSD, we assume compliance with the latter, which suggests replacement every 3.8 years for transmission sources and 4.4 years for storage sources based on operating data.
[3] We currently estimate that there are no affected centrifugal compressors or storage vessels in the transmission and storage segment.

2.1.3 Policy Review: Summary of Key Results

A summary of the key results is shown below. All estimates are in 2016 dollars. Also, all compliance costs, emissions changes, and benefits are estimated relative to a baseline without the impacts of the Policy Review and Technical Reconsideration. We estimate that the Policy Review will potentially affect approximately 38 firms.[11]

- **Emissions Analysis:** The Policy Review is projected to forgo methane emission reductions of 22,000 short tons in 2021 and 58,000 short tons in 2030 and a total of 400,000 short tons from 2021 to 2030. Forgone VOC emission reductions are projected to be 610 short tons in 2021 and 1,600 short tons in 2030 and a total of 11,000 short tons from 2021 to 2030. Forgone HAP emissions are projected to be 18 short tons in 2021 and 48 short tons in 2030 and a total of 330 short tons from 2021 to 2030.

[11] We estimate the number of firms potentially affected firms using information in the Information Collection Request (ICR) Supporting Statement associated with this rulemaking. Before promulgating the Policy Review, the EPA estimates that up to 575 firms would be subject to NSPS OOOOa during the 3-year period covered by the ICR (Table 1d of the Supporting Statement). We then estimate that up to 537 respondents per year will be subject to NSPS OOOOa during the 3-year period covered by the ICR (Section 6(d) of the Supporting Statement). As a result, we estimate the incremental number of firms potentially affected by the Policy Review to be the difference between 575 and 537, or 38 firms.

- **Benefits Analysis:** The Policy Review is projected to result in forgone climate, health, and welfare benefits. The PV of the domestic forgone climate benefits, using an interim estimate of the domestic social cost of methane (SC-CH_4) and discounting at a 7 percent rate is $17 million from 2021 to 2030. The EAV is estimated to be $2.2 million per year. Using the interim SC-CH_4 estimate based on the 3 percent rate, the PV of forgone domestic climate benefits is estimated to be $63 million; the EAV is estimated to be $7.2 million per year. The EPA expects that forgone VOC emission reductions will negatively affect air quality and likely affect health and welfare adversely due to impacts on ozone, $PM_{2.5}$, and HAP, but we are unable to quantify these effects at this time. This omission does not imply that these forgone benefits do not exist.
- **Compliance Cost Analysis:** The Policy Review is projected to result in compliance cost reductions. The PV of the compliance cost reduction associated with this final rule over the 2021 to 2030 period is estimated to be $67 million (2016$) using a 7 percent discount rate and $83 million using a 3 percent discount rate. The EAV of these cost reductions is estimated to be $8.9 million per year using a 7 percent discount rate and $9.4 million per year using a 3 percent discount rate. These estimates do not include the forgone producer revenues associated with a decrease in the recovery of saleable natural gas due to this final action, as some of the compliance actions required in the baseline would likely have captured saleable product that would have otherwise been emitted. Using the AEO2020 projection of natural gas prices to estimate the value of the change in the recovered gas at the wellhead expected to result from this action, the EPA estimated a PV of regulatory compliance cost reductions of the final rule over the 2021 to 2030 period of $31 million using a 7 percent discount rate and $38 million using a 3 percent discount rate. The corresponding estimates of the EAV of cost reductions after accounting for forgone product recovery revenues are $4.1 million per year using a 7 percent discount rate and $4.3 million per year using a 3 percent discount rate.[12]
- **Energy Markets Impacts Analysis:** The 2016 NSPS RIA estimated small (less than 1 percent) impacts on energy production and markets. The EPA expects that the deregulatory Policy Review will reduce energy market impacts of the NSPS.
- **Distributional Impacts:** The cost reductions and any forgone benefits likely to arise from the Policy Review are not expected to be distributed uniformly across the population, and may not accrue equally to the same individuals, firms, or communities impacted by the 2016 rule. The EPA did not conduct a quantitative assessment of the distributional impacts of the final Policy Review, but we provide a qualitative discussion of the distributional aspects of the cost reductions and the forgone health benefits.
- **Small Entity Impacts Analysis:** The EPA expects this final deregulatory action to reduce the small entity impacts estimated in the RIA for the 2016 NSPS OOOOa. We therefore find that this final action will relieve regulatory burden for small entities affected by this final action and thus will not have a Significant Impact on a Substantial Number of Small Entities (SISNOSE).

[12] There may also be an opportunity cost associated with the installation of environmental controls (for purposes of mitigating the emission of pollutants) that is not reflected in the control costs. In the event that investment in environmental compliance displaces other investment in productive capital, the difference between the rate of return on the investment displaced by the mandatory environmental investment is a measure of the opportunity cost of the environmental requirement. To the extent that such opportunity costs of capital are not accounted for in the estimated compliance cost reductions, the cost reductions may be underestimated.

- **Employment Impacts Analysis:** The EPA expects reductions in labor associated with compliance-related activities due to this action. The EPA estimated the labor impacts due to the forgone installation, operation, and maintenance of control equipment and control activities, as well as the reductions labor associated with reduced reporting and recordkeeping requirements. The EPA estimated one-time and continual, annual labor requirements by estimating hours of labor required for compliance and converting this to full-time equivalents (FTE) by dividing by 2,080 (40 hours per week multiplied by 52 weeks). The reduction in one-time labor needed to comply with the NSPS due to this action is estimated to be about 1.2 FTE in 2021 and 2.5 FTE in 2030. The reduction in annual labor needed to comply with the NSPS due to this action is estimated at about 29 FTE in 2021 and 65 FTE in 2030. The EPA notes that this type of FTE-estimate cannot be used to identify the specific number of employees involved or whether new jobs are created for employees who potentially lose their jobs, versus displacing jobs from other sectors of the economy.

2.1.4 Organization of the Policy Review RIA

Section 2.2 describes the estimated compliance cost reductions and forgone emissions reductions from the Policy Review, including the PV of the projected cost reductions over the 2021 to 2030 period and the associated EAV. Section 2.3 describes the projected forgone benefits resulting from this rule, including the PV and EAV over the 2021 to 2030 period. Section 2.4 describes the economic impacts expected from this action. Section 2.5 compares the projected forgone benefits and compliance cost reductions of this action, as well as a summary of the net benefits.

2.2 Projected Compliance Cost Reductions and Forgone Emissions Reductions

2.2.1 Pollution Controls and Emissions Points Assessed in this RIA

This section provides a basic description of the emissions sources and controls affected by the final Policy Review.

Fugitive Emissions Requirements: Fugitive emissions occur when connection points are not fitted properly or when seals and gaskets start to deteriorate. Pressure, changes in pressure, or mechanical stresses can also cause components or equipment to leak. Potential sources of fugitive emissions include valves, connectors, pressure relief devices, open-ended lines, flanges, closed vent systems, and thief hatches or other openings on a controlled storage vessel. These fugitive emissions do not include devices that vent as part of normal operations.

The projected cost and emission impacts assume implementation of a leak monitoring program based on the use of optical gas imaging (OGI) leak detection combined with leak correction. The monitoring and repair frequency under the baseline is quarterly for transmission and storage compressor stations.[13] This chapter presents estimates of the impacts of removing the fugitive emission requirements for compressor stations in the transmission and storage segment.

Pneumatic Controllers: Pneumatic controllers are automated instruments used for maintaining process conditions such as liquid level, pressure, pressure differential, and temperature. In many situations across all segments of the oil and natural gas industry, pneumatic controllers make use of the available high-pressure natural gas to operate or control a valve. In these "gas-driven" pneumatic controllers, natural gas may be released with every valve movement and/or continuously from the valve control pilot. Not all pneumatic controllers are gas-driven. These "non-gas-driven" pneumatic controllers use sources of power other than pressurized natural gas. Examples include solar, electric, and instrument air. At oil and gas locations with electrical service, non-gas-driven controllers are typically used. Continuous bleed pneumatic controllers can be classified into two types based on their emissions rates: (1) high-bleed controllers and (2) low-bleed controllers. This chapter presents estimates of the impact of not installing low-bleed instead of high-bleed controllers to comply with the bleed limit requirement established in the 2016 NSPS for the transmission and storage segment.

Reciprocating and Centrifugal Compressors: Compressors are mechanical devices that increase the pressure of natural gas and allow the natural gas to be transported from the production site, through the supply chain, and to the consumer. The types of compressors that are used by the oil and gas industry as prime movers are reciprocating and centrifugal compressors. Centrifugal compressors use either wet or dry seals.

Emissions from compressors occur when natural gas leaks around moving parts in the compressor. In a reciprocating compressor, emissions occur when natural gas leaks around the piston rod when pressurized natural gas is in the cylinder. Over time, during operation of the compressor, the rod packing system becomes worn and needs to be replaced to prevent excessive

[13] Monitoring frequency for compressor stations on the Alaska North Slope is annual, however, we do not estimate any compressor stations on the Alaska North Slope.

leaking from the compression cylinder. This RIA estimates the impact of removing the requirements to replace the rod packing approximately either every 3 years (36 months) or 26,000 hours in reciprocating compressors in the transmission and storage segment. As in the 2016 NSPS TSD, we assume compliance with the latter, which suggests replacement every 3.8 years for transmission sources and 4.4 years for storage sources based on operating data.

Emissions from centrifugal compressors depend on the type of seal used: either “wet,” which use oil circulated at high pressure, or “dry,” which use a thin gap of high-pressure gas. The use of dry gas seals substantially reduces emissions. In addition, their use significantly reduces operating costs and enhances compressor efficiency. The EPA evaluated using a mechanical dry seal system to limit or reduce the emissions from the rotating shaft of a centrifugal compressor. For centrifugal compressors equipped with wet seals, a flare was evaluated as an option for reducing emissions from centrifugal compressors. However, a review of 2016 NSPS OOOOa compliance reports submitted in 2018 from sources in several EPA Regions (3, 6, 8, 9, and 10) with the greatest oil and natural gas activity indicates that there are no affected centrifugal compressors in the transmission and storage segment.[14] As a result, we project there would be no affected centrifugal compressors in the future absent this rule, meaning there are no regulatory impacts associated with deregulating centrifugal compressors.

Storage vessels: Crude oil, condensate, and produced water are typically stored in fixed-roof storage vessels. Some vessels used for storing produced water may be open-top tanks. These vessels, which are operated at or near atmospheric pressure conditions, are typically used in tank batteries. A tank battery refers to the collection of process equipment used to separate, treat, and store crude oil, condensate, natural gas, and produced water. The extracted products from production wells enter the tank battery through the production header, which may collect product from many wells. Emissions from storage vessels are a result of working, breathing, and flash losses. Working losses occur due to the emptying and filling of storage tanks. Breathing losses are due to the release of gas associated with daily temperature fluctuations and other equilibrium

[14] For more information on the EPA’s review of the oil and natural gas NSPS compliance reports, see the docketed memorandum titled: U.S. EPA. 2020. Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Background Technical Support Document for the Final Reconsideration of the New Source Performance Standards, 40 CFR Part 60, subpart OOOOa. Detailed reports are also available at: *https://www.foiaonline.gov/foiaonline/action/public/submissionDetails?trackingNumber=EPA-HQ-2018-001886&type=request.* Accessed April 26, 2020.

effects. Flash losses occur when a liquid with entrained gases is transferred from a vessel with higher pressure to a vessel with lower pressure, thus allowing entrained gases or a portion of the liquid to vaporize or flash. In the oil and natural gas production segment, flashing losses occur when live crude oils or condensates flow into a storage tank from a processing vessel operated under higher pressure. Typically, the larger the pressure drop, the greater the flashing emissions in the storage stage. Two ways of control tanks with significant emissions are to install a vapor recovery unit (VRU) and recover all the vapors from the tanks, or to route the emissions from the tanks to a control device. However, a review of 2016 NSPS OOOOa compliance reports submitted in 2018 from sources in the EPA Regions (3, 6, 8, 9, and 10) with the greatest oil and natural gas activity indicates that there were no storage vessels emitting more than 6 tons per year of VOC in the transmission and storage segment,[15] and therefore we presume there are no regulatory impacts associated with deregulating sources of this type.

2.2.2 Compliance Cost Analysis

There are two main steps in the compliance cost analysis. First, the EPA developed a representative or model plant for each affected emission source, point, and control option.[16] The characteristics of the model plant include typical equipment, operating characteristics, and representative factors including baseline emissions and the costs, emissions reductions, and product recovery resulting from each control option. This source-level cost and emission information for the requirements affected by this action can be found in a docketed technical memorandum associated with this action.[17] Second, the number of incrementally affected facilities for each type of equipment or facility are estimated. Changes in national-level emissions and cost estimates are calculated by multiplying the modeled source-level estimates from the first step by the number of affected facilities in each projection year from the second step. In addition to emissions reductions, some control options result in natural gas recovery, which can then be combusted in production or sold. The estimates of national cost reductions include the value of the forgone product recovery where applicable.

[15] Ibid.
[16] See Section 2 of the TSD accompanying this final action for more detail on how model plants were developed.
[17] U.S. EPA. 2020. Memorandum: Control Cost and Emission Changes under the Final Amendments to 40 CFR Part 60, subpart OOOOa Under Executive Order 13783.

In this section, we present the costs and emissions impacts of the Policy Review from 2021 through 2030, under the assumption that 2021 is the first full year any changes from this action will be in effect. In addition, we provide detailed analysis for 2021 and 2030, which allows the reader to draw comparisons between the first year after the promulgation of the Policy Review and nine years after the impacts have accumulated.[18] While it would be desirable to analyze impacts beyond 2030, the EPA has chosen not to, largely because of the limited information available to model long-term changes in practices and equipment use in the oil and natural gas industry. For example, the EPA has limited information on how practices, equipment, and emissions at new facilities change as they age or shut down. The current analysis assumes that newly established facilities remain in operation for the entire analysis period, which would be less realistic in a longer-term analysis. In addition, in a dynamic industry like oil and natural gas, technological progress is likely to change control methods to a greater extent over a longer time horizon, creating more uncertainty about impacts of the NSPS. For example, the current analysis does not include potential fugitive emissions controls employing remote sensing technologies currently under development.

2.2.3 Projection of Affected Facilities

To project the number of NSPS-affected facilities in transmission and storage, we first updated the number of NSPS-affected facilities for this analysis using average year-over-year increases in facility counts from the GHGI.[19] We assumed that this average number of new affected sources

[18] Any comparison of the 2016 NSPS RIA results to this analysis should be done with caution. The baseline of affected sources has been updated in this analysis, the years of analysis are different, and results in this RIA are presented in 2016 dollars, while the 2016 NSPS RIA presents results in 2012 dollars.

[19] More detailed description of the calculations on new sources are provided in Appendix A. We applied the year-by-year rate of change derived from AEO2020 oil and natural gas drilling projections to the estimated number of wells in 2014 from DrillingInfo, regardless of well type, to project the estimated number of new well sites through 2030.. In addition to well sites, the fugitive emissions requirements apply to gathering and boosting stations, transmission compressor stations, and storage compressor stations. The GHGI is used to estimate the count of newly affected compressor stations in each year. The GHGI uses a variety of data sources and studies to estimate equipment counts and emissions. Many equipment counts are based on the data reported under the GHGRP, scaled up to reflect the total population including both GHGRP-reporting and non-reporting oil and natural gas facilities. We estimated the number of new compressor stations, by type, by averaging the increases in the year-to-year changes in total national counts of equipment over the 10-year period from 2004 through 2014. Year-to-year increases were assumed to represent newly constructed facilities. Decreases in total counts were represented as zeros for that year, and average together with the annual increases. This approach results in the same number of new compressor stations in each projected year, regardless of increases or decreases in AEO projected drilling or production. The average year-to-year increase in compressor station counts are: 212 for gathering and boosting stations, 36 for transmission compressor stations, and 2 for storage compressor stations.

is constant from 2021 through 2030. While new source counts are likely to vary across years, we use this assumption as our best approximation of the average number of new sources in each year. See Appendix A for details on activity count projections.

Over time, facilities are constructed or modified in each year, and to the extent the facilities remain in operation in future years, the total number of facilities subject to the NSPS accumulates.[20] This analysis assumes that all projected new sources from 2015 through 2029 are still in operation in 2030. These sources include fugitive emissions sources at compressor stations, pneumatic controllers, and centrifugal and reciprocating compressors.[21]

Table 2-3 shows the projected number of NSPS-affected sources in each year. The estimates for affected sources are based upon projections of new sources alone, and do not include replacement or modification of existing sources. While some of these sources are unlikely to be modified, the impact estimates may be underestimated due to the focus on new sources. For compressor stations and reciprocating compressors, newly constructed affected facilities are estimated based on averaging year-to-year changes in activity data in the GHGI between 2004 and 2014. The approach averages the number of newly constructed units in all years. In years when the total count of equipment decreased, there were assumed to be no new units. For pneumatic controllers, we use the same averaging technique applied to 2011 to 2014 GHGI data, since the Inventory did not disaggregate pneumatic controllers into high and low bleed prior to 2011.[22] We assume there are no new wet seal centrifugal compressors or affected storage vessels based on the assessment of the recent NSPS oil and natural gas compliance reports.[23]

[20] This RIA provides more detailed information than previous oil and natural gas NSPS RIA analyses by including year-by-year results over the 2021 to 2030 analysis period.

[21] Due to data limitations, we do not quantify any emissions or cost changes associated with new compressor stations on the Alaska North Slope.

[22] Based on comment received on the proposal of this rule, we treat the installation of low-bleed pneumatic controllers from 2015 to 2020 as irreversible, meaning that they are not assumed to be replaced with high-bleed controllers as a result of this action until the end of their assumed equipment lifetime.

[23] For more information on the EPA's review of the oil and natural gas NSPS compliance reports, see the docketed memorandum titled: U.S. EPA. 2020. Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Background Technical Support Document for the Final Reconsideration of the New Source Performance Standards, 40 CFR Part 60, subpart OOOOa. Detailed reports are also available at: *https://www.foiaonline.gov/foiaonline/action/public/submissionDetails?trackingNumber=EPA-HQ-2018-001886&type=request.* Accessed April 26, 2020.

Table 2-3 Projected NSPS-Affected Sources in Transmission and Storage, 2021 to 2030[24]

Year	Compressor Stations	Reciprocating Compressors	Centrifugal Compressors	Pneumatic Controllers[1]	Storage Vessels	Total
2021	270	530	0	310	0	1,100
2022	300	610	0	620	0	1,500
2023	340	680	0	920	0	2,000
2024	380	760	0	1,200	0	2,400
2025	420	840	0	1,500	0	2,800
2026	460	910	0	1,800	0	3,200
2027	490	990	0	2,200	0	3,600
2028	530	1,100	0	2,500	0	4,100
2029	570	1,100	0	2,800	0	4,500
2030	610	1,200	0	3,400	0	5,200

Note: Estimates may not sum due to independent rounding
[1] Counts in this column do not include pneumatic controllers installed between 2015 and 2020, which are affected sources under the NSPS but are not expected to change activities as a result of this action until the end of their assumed equipment lifetimes.

There have been multiple updates to the GHGI, and the data the EPA used to estimate the number of affected sources in the 2016 NSPS OOOOa was revised where appropriate. We updated the time period used to estimate the number of affected sources. The 2016 NSPS RIA used the ten-year period leading up to 2012, whereas this proposed action estimates the number of affected sources in the ten-year period leading up to 2014. The projected number of affected sources in the transmission and storage segment is sensitive to the ten-year period used for averaging. For example, the 2016 NSPS RIA estimated four new transmission compressor stations a year, and this analysis estimates 36 new transmission compressor stations per year. Though the difference in the count of affected sources as estimated for the 2016 NSPS RIA and the Policy Review is large, when compared to the total number of transmission compressor

[24] See Appendix A for more discussion. Nationwide impacts of certifications for closed vent system design and technical infeasibility of routing pneumatic pumps to an existing control device, rod-packing replacements at reciprocating compressors, route-to-control measures for wet-seal centrifugal compressors, and use of low-bleed pneumatic controllers were calculated by estimating the count of affected facilities installed in a typical year and then using that typical year estimate to estimate the number of new affected facilities for each of the years in the study period, 2021 through 2030. The basis for the counts of affected facilities that would require closed vent system and technical infeasibility certifications in a typical year was information from 2016 NSPS OOOOa compliance information for 2017. These represent the number of new affected facilities in a "typical year." The GHGI was used to generate counts of reciprocating compressors and pneumatic controllers in transmission and storage only. The 2017 compliance report's nationwide number of new affected facilities reported are: 663 pneumatic pumps, 180 reciprocating compressors, 0 centrifugal compressors, 697 storage vessels and 308 pneumatic controllers

stations nationally in 2014 (about 1,800), both are small: 0.2 percent and 2.0 percent, respectively.

In addition, since the 2016 NSPS RIA (which used 2015 GHGI data), the EPA updated the GHGI methodology used to develop station counts. This update had only a small impact on total national counts in the GHGI.[25] The update also resulted in minor changes in year-to-year trends, which have impacted the affected source projection. National estimates of other sources (*e.g.*, compressors and pneumatic controllers) in the transmission and storage segment rely on station counts as an input and are therefore impacted by this change as well. As annual national counts of transmission and storage stations are not directly available from any national-level data source, the EPA applies a methodology to estimate the total national counts of transmission and storage stations. This method was updated between the 2015 GHGI and the 2018 GHGI. For the 2016 NSPS, (using the previous GHGI methodology) transmission station counts were estimated by applying a factor of stations per mile of transmission pipeline to the total national transmission pipeline mileage.[26] Storage station counts were also developed using the previous GHGI methodology (applying a factor of stations per unit of gas consumption to total national gas consumption). In this RIA, transmission station counts are developed using updated data from the 2018 GHGI. In the 2018 GHGI, transmission stations are estimated based on scaled-up Greenhouse Gas Reporting Program (GHGRP) data. Storage stations are estimated by applying a factor to total national storage fields. These improvements to the methods were developed with stakeholder input.

2.2.4 Forgone Emissions Reductions

Table 2-4 summarizes the forgone emissions reductions associated with the Policy Review. The forgone emissions reductions are estimated by multiplying the source-level forgone emissions

[25] For example, the 2018 GHG Inventory estimate of station counts in 2013 is 5 percent lower for transmission stations and 12 percent lower for storage stations.

[26] The EPA used the GHGRP subpart W station count scaled by a factor of 3.52 to adjust for GHGRP coverage. In 2016 for example, 529 transmission stations reported to GHGRP, and the national GHG Inventory calculated 1,862 transmission stations as the national total.

reductions associated with each applicable control and facility type by the number of affected sources of that facility type.[27]

Table 2-4 Projected Forgone Emissions Reductions from Policy Review, 2021 to 2030

	Emission Changes			
Year	**Methane (short tons)**	**VOC (short tons)**	**HAP (short tons)**	**Methane (metric tons CO_2 Eq.)**
2021	22,000	610	18	500,000
2022	26,000	720	21	590,000
2023	30,000	830	25	680,000
2024	34,000	940	28	770,000
2025	38,000	1,000	31	860,000
2026	42,000	1,200	34	940,000
2027	46,000	1,300	37	1,000,000
2028	49,000	1,400	41	1,100,000
2029	53,000	1,500	44	1,200,000
2030	58,000	1,600	48	1,300,000
Total	400,000	11,000	330	9,000,000

Note: Estimates may not sum due to independent rounding.

2.2.5 Forgone Product Recovery

The projected compliance cost reductions presented below include the forgone revenue from the reductions in natural gas recovery projected under the Policy Review. Requirements for compressor stations, reciprocating compressors, and pneumatic controllers are assumed to increase the capture of methane and VOC emissions that would otherwise be vented to the atmosphere, and we assume that a large proportion of the averted methane emissions can be directed into natural gas production streams and sold.

Table 2-5 summarizes the decrease in natural gas recovery and the associated forgone revenue. The AEO2020 projects Henry Hub natural gas prices rising from $2.49/MMBtu in 2021 to $3.29/MMBtu in 2030 in 2019 dollars.[28] To be consistent with other financial estimates in the

[27] For more information on the EPA's review of the oil and natural gas NSPS compliance reports, see the docketed memorandum titled: U.S. EPA. 2020. Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Background Technical Support Document for the Final Reconsideration of the New Source Performance Standards, 40 CFR Part 60, subpart OOOOa. Detailed reports are also available at: *https://www.foiaonline.gov/foiaonline/action/public/submissionDetails?trackingNumber=EPA-HQ-2018-001886&type=request.* Accessed April 26, 2020.

[28] Available at: http://www.eia.gov/forecasts/aeo/tables_ref.cfm. Accessed April 26, 2020

RIA, we adjust the projected prices in AEO2020 from 2019 dollars to 2016 dollars using the GDP-Implicit Price Deflator. We also adjust prices for the wellhead using an EIA study that indicated that the Henry Hub price is, on average, about 11 percent higher than the wellhead price,[29] and therefore we use a conversion factor of 1.036 MMBtu equals 1 Mcf. Incorporating these adjustments, wellhead natural gas prices are assumed to rise from $2.20/Mcf in 2021 to $2.89/Mcf in 2030.

Table 2-5 Projected Decrease in Natural Gas Recovery for Policy Review, 2021 to 2030

Year	Decrease in Gas Recovery (Mcf)	Forgone Revenue (millions 2016$)
2021	1.3	$2.5
2022	1.5	$3.0
2023	1.7	$3.4
2024	2.0	$4.0
2025	2.2	$4.9
2026	2.4	$5.8
2027	2.6	$6.7
2028	2.9	$7.5
2029	3.1	$8.1
2030	3.4	$8.7

Operators in the transmission and storage segment of the industry do not typically own the natural gas they transport; rather, they receive payment for the transportation service they provide. From a social perspective, however, the increased financial returns from natural gas recovery accrues to entities somewhere along the natural gas supply chain and should be accounted for in a national-level analysis. An economic argument can be made that, in the long run, no single entity bears the entire burden of compliance costs or fully appropriates the financial gain of the additional revenues associated with natural gas recovery. The change in economic surplus resulting from natural gas recovery is likely to be spread across different market participants. Therefore, the simplest and most transparent option for allocating these revenues would be to keep the compliance costs and revenues within a given source category and not make assumptions regarding the allocation of costs and revenues across agents.[30]

[29] See: https://www.researchgate.net/publication/265155970_US_Natural_Gas_Markets_Relationship_Between_Henry_Hub_Spot_Prices_and_US_Wellhead_Prices. Accessed 04/26/2020.

[30] As a sensitivity, we calculated forgone natural gas revenues using the Henry Hub price instead of the estimated wellhead price, as the former may better reflect the value of natural gas in the transmission and storage segment.

2.2.6 Compliance Cost Reductions

Table 2-6 summarizes the compliance cost reductions and forgone revenue from product recovery for the evaluated emissions sources and points. Total cost reductions consist of capital cost reductions; annual operating and maintenance cost reductions, including reporting and recordkeeping costs;[31] and forgone revenue from product recovery. Capital cost reductions include the capital cost reductions from removing the requirements on newly affected controllers and compressors and the planning cost reductions from removing requirements for compressor stations to create survey monitoring plans for the fugitive emissions, as well as the cost reductions for sources that would have had to renew survey monitoring plans or purchase new capital equipment at the end of its useful life. The annual operating and maintenance cost reductions are due to the fugitives monitoring requirement and other reporting and recordkeeping requirements.

Under this alternative fuel price assumption, the forgone revenue associated with unrecovered natural gas is $3.4 million in 2021 and $10.4 million in 2030.

[31] Reporting and recordkeeping cost reductions not due to changes in the fugitive emissions monitoring requirements were drawn from the information collection request (ICR) that have been submitted to the Office of Management and Budget (OMB) under the Paperwork Reduction Act (see preamble for more detail). These reporting and recordkeeping cost reductions are estimated to be about $210,000 in 2021 and increasing to about $330,000 in 2030. Reporting and recordkeeping cost reductions for fugitive emissions monitoring requirements are captured directly as operating and maintenance cost reductions associated with that program. Recordkeeping and recordkeeping cost reductions are estimated for the Policy Review for all affected facilities regardless of whether they are in states with regulatory requirements similar to the final 2016 NSPS OOOOa.

Table 2-6 Estimated Cost Reductions under the Policy Review, 2021 to 2030 (millions 2016$)

Year	Compliance Cost Reductions: Capital Cost Reductions[1]	Operating and Maintenance Cost Reductions	Annualized Cost Reductions (w/o Forgone Revenue)[2]	Forgone Revenue from Product Recovery	Annualized Cost Reductions (with Forgone Revenue)
2021	$1.9	$4.2	$6.2	$2.5	$3.7
2022	$1.9	$4.8	$7.1	$3.0	$4.1
2023	$3.2	$5.4	$8.0	$3.4	$4.5
2024	$3.2	$5.9	$8.8	$4.0	$4.8
2025	$3.2	$6.5	$10	$4.9	$4.8
2026	$3.2	$7.1	$11	$5.8	$4.7
2027	$3.6	$7.7	$11	$6.7	$4.7
2028	$3.6	$8.3	$12	$7.5	$4.9
2029	$3.6	$8.9	$13	$8.1	$5.1
2030	$3.7	$9.5	$14	$8.7	$5.4

Note: Sums may not total due to independent rounding.
[1] The capital cost reductions include the planning cost reductions for newly affected sources for fugitive emissions monitoring and capital cost reductions for newly affected controllers and compressors, as well as the cost reductions for sources that would renew survey monitoring plans and purchase new capital at the end of its useful life.
[2] These cost reductions include the capital cost reductions annualized over the requisite equipment lifetimes at an interest rate of 7 percent and the annual operating and maintenance cost reductions for every year, which include the cost reductions from recordkeeping and reporting.

The cost of designing, or redesigning, a fugitive emissions monitoring program occurs every eight years to comply with the 2016 NSPS OOOOa. Pneumatic controllers are assumed to have a lifetime of ten years. Rod packing replacement is assumed to happen about every 3.8 years in the transmission segment and every 4.4 years in the storage segment.[32] The lifetime of the sources affected by this action are unchanged from the assumptions used for the 2016 NSPS OOOOa. The reduction in capital costs in each year outlined in Table 2-6 includes the estimated reduction in costs for newly affected sources in that year, plus the reduction in costs for sources affected previously that have reached the end of their assumed economic lifetime.

The capital and planning cost reductions for reciprocating compressors, pneumatic controllers, and fugitive emissions monitoring program design are annualized over their requisite expected lifetimes at an interest rate of 7 percent and are added to the annual operating and maintenance cost reductions of the requirements to get the annualized cost reductions in each year. The

[32] For the purposes of assigning unannualized capital costs of subsequent replacements to years, we round the lifetimes for rod packing in both transmission and storage to four years.

forgone value of product recovery is then subtracted to get the total annualized cost reductions in each year.

Table 2-7 illustrates the sensitivity of the estimated cost reductions to a given interest rate. We present cost reductions using interest rates of 7 and 3 percent. The choice of interest rate has a very small effect on nationwide annualized cost reductions. The interest rate generally affects estimates of annualized costs for controls with high planning or capital costs relative to annual costs. In this analysis, the planning and capital cost reductions are small relative to the annual operating and maintenance cost reductions, so the interest rate has little impact on total annualized cost reductions for these sources.

Table 2-7 Estimated Cost Reductions for the Policy Review, 2021 to 2030 (millions 2016$)

	7 percent			3 percent		
Year	**Annualized Cost Reductions (w/o Forgone Revenue)**	**Forgone Revenue from Product Recovery**	**Annualized Cost Reductions (with Forgone Revenue)**	**Annualized Cost Reductions (w/o Forgone Revenue)**	**Forgone Revenue from Product Recovery**	**Annualized Cost Reductions (with Forgone Revenue)**
2021	$6.2	$2.5	$3.7	$6.0	$2.5	$3.4
2022	$7.1	$3.0	$4.1	$6.8	$3.0	$3.9
2023	$8.0	$3.4	$4.5	$7.6	$3.4	$4.2
2024	$8.8	$4.0	$4.8	$8.5	$4.0	$4.5
2025	$10	$4.9	$4.8	$9.3	$4.9	$4.4
2026	$11	$5.8	$4.7	$10	$5.8	$4.3
2027	$11	$6.7	$4.7	$11	$6.7	$4.3
2028	$12	$7.5	$4.9	$12	$7.5	$4.4
2029	$13	$8.1	$5.1	$13	$8.1	$4.6
2030	$14	$8.7	$5.4	$14	$8.7	$4.9

Note: Estimates may not sum due to independent rounding.

2.2.7 Detailed Impacts Tables

The following tables show the full details of the cost reductions and forgone emissions reductions by emissions source in 2021 and 2030.

Two of the affected source types, reciprocating compressors and pneumatic controllers, have negative cost reductions, meaning that the potential capital and annual cost reductions from deregulating the transmission and storage segment may be outweighed by the forgone revenue from product recovery. This observation may typically support an assumption that operators would continue to perform the emissions abatement activity, regardless of whether a requirement is in place, because it is in their private self-interest. However, as discussed in the 2016 RIA, operators in the transmission and storage segment of the industry do not typically own the natural gas they transport; rather, the operators receive payment for the transportation service they provide. As a result, financial incentives to reduce emissions may be minimal because operators are not able to recoup the financial value of captured natural gas that may otherwise be emitted. Alternatively, there may also be an opportunity cost associated with the installation of environmental controls (for purposes of mitigating the emission of pollutants) that is not reflected in the control costs. If environmental investment displaces investment in productive capital, the difference between the rate of return on the marginal investment displaced by the mandatory environmental investment is a measure of the opportunity cost of the environmental requirement to the regulated entity. To the extent that any opportunity costs are not added to the control costs, the compliance cost reductions presented above may be underestimated.

Table 2-8 Affected Sources, Forgone Emissions Reductions, and Compliance Cost Reductions for the Policy Review, 2021

Source/Emissions Points in Transmission and Storage	Projected No. of Affected Sources	Forgone Emissions Reductions: Methane (short tons)	VOC (short tons)	HAP (short tons)	Methane (metric tons CO_2 Eq.)	Compliance Cost Reductions (millions $2016): Annualized Capital Cost Reductions	Operating and Maintenance Reductions	Forgone Product Recovery	Total Annualized Cost Reductions with Forgone Revenue
Fugitive Emissions - Compressor Stations	270	9,700	270	8.0	220,000	$1.00	$4.0	$1.1	$3.9
Reciprocating Compressors	530	12,000	320	9.5	260,000	$0.99	$0	$1.3	-$0.32
Centrifugal Compressors	0	0	0	0	0	$0	$0	$0	$0
Pneumatic Controllers	310	860	24	0.7	19,000	$0.008	$0	$0.10	-$0.09
Reporting and Recordkeeping[1]	N/A	0	0	0	0	$0	$0.21	$0	$0.21
TOTAL	**1,100**	**22,000**	**610**	**18**	**500,000**	**$2.0**	**$4.2**	**$2.5**	**$3.7**

Note: Estimates may not sum due to independent rounding.
[1] Applies to reporting and recordkeeping for requirements other than the fugitive emissions monitoring requirements.

Table 2-9 Affected Sources, Forgone Emissions Reductions, and Compliance Cost Reductions for the Policy Review, 2030

Source/Emissions Points in Transmission and Storage	Projected No. of Affected Sources	Forgone Emissions Reductions: Methane (short tons)	VOC (short tons)	HAP (short tons)	Methane (metric tons CO_2 Eq.)	Compliance Cost Reductions (millions $2016): Annualized Capital Cost Reductions	Operating and Maintenance Reductions	Forgone Product Recovery	Total Annualized Cost Reductions with Forgone Revenue
Fugitive Emissions - Compressor Stations	610	22,000	620	18	500,000	$2.3	$9.1	$3.3	$8.1
Reciprocating Compressors	1,200	26,000	730	22	600,000	$2.3	$0	$3.9	-$1.7
Centrifugal Compressors	0	0	0	0	0	$0	$0	$0	$0
Pneumatic Controllers	3,400	9,400	260	8	210,000	$0.09	$0	$1.4	-$1.3
Reporting and Recordkeeping[1]	N/A	0	0	0	0	$0	$0.33	$0	$0.33
TOTAL	**5,200**	**58,000**	**1,600**	**48**	**1,300,000**	**$4.7**	**$9.1**	**$8.7**	**$5.4**

Note: Estimates may not sum due to independent rounding.
[1] Applies to reporting and recordkeeping for requirements other than the fugitive emissions monitoring requirements.

2.2.8 Present Value and Equivalent Annualized Value of Cost Reductions

This section presents the compliance cost reductions of the Policy Review in a PV framework. The stream of the estimated cost reductions for each year from 2021 through 2030 is discounted back to 2020 using 7 and 3 percent discount rates and summed to get the PV of the cost reductions. The PV is then used to estimate the EAV of the cost reductions. The EAV is the single annual value which, if summed in PV terms across years in the analytical time frame, equals the PV of the original (*i.e.*, likely time-varying) stream of cost reductions. In other words, the EAV takes the potentially "lumpy" stream of cost reductions and converts them into a single value that, when discounted and added together over each period in the analysis time frame, equals the original stream of values in PV terms.

Table 2-10 shows the undiscounted stream of cost reductions for each year from 2021 through 2030 due to the Policy Review. Capital cost reductions are the projected capital and planning costs which will no longer be incurred. Total cost reductions are the sum of the capital cost reductions, annual operating cost reductions, and reporting and recordkeeping cost reductions. The forgone revenue from the decrease in product recovery is estimated using the AEO2020 natural gas price projections, as described earlier. Total cost reductions with forgone revenue equals the total cost reductions minus the forgone revenue. Over time, with the addition of new affected sources in each year, the capital cost reductions, annual operating cost reductions, reporting and recordkeeping cost reductions, and forgone revenue increase.

Table 2-10 Undiscounted Projected Compliance Cost Reductions for the Policy Review, 2021-2030 (millions 2016$)

Year	Capital Cost Reductions	Annual Operating Cost Reductions	Total Cost Reductions (w/o Forgone Revenue)	Forgone Revenue from Product Recovery	Total Cost Reductions (with Forgone Revenue)
2021	$1.9	$4.0	$6.1	$2.5	$3.5
2022	$1.9	$4.6	$6.6	$3.0	$3.7
2023	$3.2	$5.1	$8.5	$3.4	$5.1
2024	$3.2	$5.7	$9.1	$4.0	$5.1
2025	$3.2	$6.3	$10	$4.9	$4.8
2026	$3.2	$6.8	$10	$5.8	$4.5
2027	$3.6	$7.4	$11	$6.7	$4.6
2028	$3.6	$8.0	$12	$7.5	$4.5
2029	$3.6	$8.5	$13	$8.1	$4.4
2030	$3.7	$9.1	$13	$8.7	$4.5

Note: Estimates may not sum due to independent rounding.

Table 2-11 shows the discounted stream of cost reductions discounted to 2020 using a 7 percent discount rate. The PV of total compliance cost reductions is $31 million, with an EAV of $4.1 million per year. The PV of the stream of cost reductions discounted to 2020 using a 3 percent discount rate is $38 million, with an EAV of $4.3 million per year.

Table 2-11 Discounted Cost Reductions for the Policy Review using 7 and 3 Percent Discount Rates (millions 2016$)[1]

Year	7 Percent			3 Percent		
	Total Annual Cost Reductions (w/o Forgone Revenue)	Forgone Revenue from Product Recovery	Total Cost Reductions (with Forgone Revenue)	Total Annual Cost Reductions (w/o Forgone Revenue)	Forgone Revenue from Product Recovery	Total Cost Reductions (with Forgone Revenue)
2021	$5.7	$2.4	$3.3	$5.9	$2.4	$3.4
2022	$5.8	$2.6	$3.2	$6.2	$2.8	$3.5
2023	$7.0	$2.8	$4.2	$7.8	$3.1	$4.7
2024	$7.0	$3.1	$3.9	$8.0	$3.6	$4.5
2025	$6.9	$3.5	$3.4	$8.3	$4.2	$4.2
2026	$6.9	$3.9	$3.0	$8.5	$4.9	$3.7
2027	$7.1	$4.2	$2.9	$9.1	$5.5	$3.8
2028	$6.9	$4.3	$2.6	$9.3	$5.9	$3.5
2029	$6.8	$4.4	$2.4	$9.4	$6.2	$3.4
2030	$6.7	$4.4	$2.3	$10	$6.5	$3.3
PV	**$67**	**$36**	**$31**	**$83**	**$45**	**$38**
EAV	**$8.9**	**$4.7**	**$4.1**	**$9.4**	**$5.1**	**$4.3**

Note: Estimates may not sum due to independent rounding.
[1] Cost reductions and forgone revenue in each year are discounted to 2020.

The Policy Review is considered a deregulatory action under E.O. 13771, Reducing Regulation and Controlling Regulatory Costs. The PV of the projected cost reductions from the Policy Review calculated in accordance with E.O. 13771 accounting standards are $45 million over an infinite time horizon (in 2016$, discounted to 2016 at 7 percent). The EAV of the cost reductions over an infinite time horizon are $3.2 million per year (in 2016$, discounted to 2016 at 7 percent).

2.3 Forgone Benefits

2.3.1 Introduction

For the oil and natural gas sector NSPS promulgated in 2012 and 2016, the EPA projected climate and ozone benefits from methane reductions, ozone and fine particulate matter ($PM_{2.5}$) health benefits from VOC reductions, and health benefits from ancillary HAP reductions. These benefits were expected to occur because the control techniques to meet the standards simultaneously reduce methane, VOC, and HAP emissions.[33] As in the 2016 NSPS RIA, methane is the only pollutant with monetized impacts in this RIA. The Policy Review is projected to forgo emissions reductions relative to the baseline. The total forgone emissions reductions over 2021 to 2030 is estimated to be about 400,000 short tons of methane, 11,000 tons of VOC, and 330 tons of HAP. The associated increase in CO_2 Eq. methane emissions is estimated to be 9 million metric tons.

The PV of the projected forgone methane-related climate benefits are estimated to be $19 million from 2021 to 2030 using an interim estimate of the domestic social cost of methane (SC-CH_4) and discounted at 7 percent. The associated EAV is estimated to be $2.9 million per year. Using the interim SC-CH_4 estimate based on the 3 percent rate, the PV of the forgone domestic climate benefits is estimated to be $63 million, and the EAV is estimated to be $10 million per year.

Under the final action, the EPA expects that the forgone VOC emission reductions will worsen air quality and adversely affect health and welfare due to the impacts on ozone, $PM_{2.5}$, and HAP, but we did not quantify these impacts at this time. This omission should not imply that these forgone benefits do not exist, and to the extent that the EPA were to quantify the ozone and PM impacts, it would estimate the number and value of avoided premature deaths and illnesses using the approach detailed in the PM National Ambient Air Quality Standards (NAAQS) and Ozone NAAQS RIAs (U.S. EPA, 2012b; U.S. EPA, 2014). This approach relies on full-form air quality modeling. The Agency is committed to assessing ways of conducting full-form air quality modeling for the oil and gas sector that would be suitable for use in regulatory analysis in the context of New Source Performance Standards, including ways to address the uncertainties regarding the scope and magnitude of VOC emissions. When quantifying the incidence and economic value of the human health impacts of air quality changes, the Agency sometimes relies upon alternative approaches to using full-form air quality modeling, called reduced-form techniques, often reported as "benefit-per-ton" values that relate air pollution impacts to changes in air pollutant precursor emissions (U.S. EPA, 2018). A small, but growing, literature characterizes the air quality and health impacts from the oil and natural gas sector, including

[33] The specific control techniques for the 2016 NSPS OOOOa were also anticipated to have minor disbenefits resulting from secondary emissions of carbon dioxide (CO_2), nitrogen oxides (NO_X), PM, carbon monoxide (CO), and total hydrocarbons (THC), and emission changes associated with the energy markets impacts. This final action is anticipated to reduce these minor secondary emissions.

preliminary VOC benefit-per-ton values (Fann et al., 2018; Litovitz et al., 2013; Loomis and Haefele, 2017). The Agency feels more work needs to be done to vet the analysis and methodologies for all potential approaches for valuing the health effects of VOC emissions before they are used in regulatory analysis but is committed to continuing this work.

In addition, the EPA systematically compared the changes in benefits, and concentrations where available, from its benefit-per-ton technique and other reduced-form techniques to the changes in benefits and concentrations derived from full-form photochemical model representation of five different stationary and mobile source emissions scenarios (IEc, 2019).[34] The Agency's goal was to create a methodology by which investigators could better understand the suitability of alternative reduced-form air quality modeling techniques for estimating the health impacts of criteria pollutant emissions changes in the EPA's benefit-cost analysis, including the extent to which reduced form models may over- or under-estimate benefits (compared to full-scale modeling) under different scenarios and air quality concentrations. The EPA Science Advisory Board (SAB) recently convened a panel to review this report.[35] In particular, the SAB will assess the techniques the Agency used to appraise these tools; the Agency's approach for depicting the results of reduced-form tools; and steps the Agency might take for improving the reliability of reduced-form techniques for use in future RIAs.

For these reasons, we did not quantify VOC-related health impacts in this RIA. This omission should not imply that these forgone benefits may not exist; rather, it reflects the inherent difficulties in modeling the direct and indirect impacts of the reductions in emissions for this industrial sector with the data currently available. Here, we qualitatively assess the forgone health benefits associated with reducing exposure to these pollutants, as well as visibility impairment and forgone ecosystem benefits. Table 2-12 summarizes the quantified and unquantified forgone benefits in this analysis.

[34] This analysis compared the benefits estimated using full-form photochemical air quality modeling simulations (CMAQ and CAMx) against four reduced-form tools, including InMAP; AP2/3; EASIUR and EPA's benefit-per-ton.

[35] 85 FR 23823. April 29, 2020.

Table 2-12 Climate and Human Health Effects of Forgone Emission Reductions under the Policy Review

Category	Specific Effect	Effect Has Been Quantified	Effect Has Been Monetized	More Information
Environment				
Climate effects	Climate impacts from methane (CH_4)	—[1]	✓	Section 3.3
	Other climate impacts (e.g., ozone, black carbon, aerosols, other impacts)	—	—	IPCC, Ozone ISA, PM ISA[2]
Human Health				
Incidence of premature mortality from exposure to $PM_{2.5}$	Adult premature mortality based on cohort study estimates and expert elicitation estimates (age >25 or age >30)	—	—	PM ISA[3]
	Infant mortality (age <1)	—	—	PM ISA[3]
Incidence of morbidity from exposure to $PM_{2.5}$	Non-fatal heart attacks (age > 18)	—	—	PM ISA[3]
	Hospital admissions—respiratory (all ages)	—	—	PM ISA[3]
	Hospital admissions—cardiovascular (age >20)	—	—	PM ISA[3]
	Emergency room visits for asthma (all ages)	—	—	PM ISA[3]
	Acute bronchitis (age 8-12)	—	—	PM ISA[3]
	Lower respiratory symptoms (age 7-14)	—	—	PM ISA[3]
	Upper respiratory symptoms (asthmatics age 9-11)	—	—	PM ISA[3]
	Asthma exacerbation (asthmatics age 6-18)	—	—	PM ISA[3]
	Lost work days (age 18-65)	—	—	PM ISA[3]
	Minor restricted-activity days (age 18-65)	—	—	PM ISA[3]
	Chronic Bronchitis (age >26)	—	—	PM ISA[3]
	Emergency room visits for cardiovascular effects (all ages)	—	—	PM ISA[3]
	Strokes and cerebrovascular disease (age 50-79)	—	—	PM ISA[3]
	Other cardiovascular effects (e.g., other ages)	—	—	PM ISA[2]
	Other respiratory effects (e.g., pulmonary function, non-asthma ER visits, non-bronchitis chronic diseases, other ages and populations)	—	—	PM ISA[2]
	Reproductive and developmental effects (e.g., low birth weight, pre-term births, etc.)	—	—	PM ISA[2,4]
	Cancer, mutagenicity, and genotoxicity effects	—	—	PM ISA[2,4]
Incidence of mortality from exposure to ozone	Premature mortality based on short-term study estimates (all ages)	—	—	Ozone ISA[3]
	Premature mortality based on long-term study estimates (age 30–99)	—	—	Ozone ISA[3]
Incidence of morbidity from exposure to ozone	Hospital admissions—respiratory causes (age > 65)	—	—	Ozone ISA[3]
	Hospital admissions—respiratory causes (age <2)	—	—	Ozone ISA[3]
	Emergency department visits for asthma (all ages)	—	—	Ozone ISA[3]
	Minor restricted-activity days (age 18–65)	—	—	Ozone ISA[3]

Category	Specific Effect	Effect Has Been Quantified	Effect Has Been Monetized	More Information
	School absence days (age 5–17)	—	—	Ozone ISA[3]
	Decreased outdoor worker productivity (age 18–65)	—	—	Ozone ISA[3]
	Other respiratory effects (e.g., premature aging of lungs)	—	—	Ozone ISA[2]
	Cardiovascular and nervous system effects	—	—	Ozone ISA[2]
	Reproductive and developmental effects	—	—	Ozone ISA[2,4]
Incidence of morbidity from exposure to HAP	Effects associated with exposure to hazardous air pollutants such as benzene	—	—	ATSDR, IRIS[2,3]
Welfare				
Visibility	Visibility in Class 1 areas	—	—	PM ISA[3]
	Visibility in residential areas	—	—	PM ISA[3]
Effects from PM deposition (organics)	Effects on Individual organisms and ecosystems	—	—	PM ISA[2]
Vegetation and ecosystem effects from exposure to ozone	Visible foliar injury on vegetation	—	—	Ozone ISA[3]
	Reduced vegetation growth and reproduction	—	—	Ozone ISA[3]
	Yield and quality of commercial forest products and crops	—	—	Ozone ISA[3]
	Damage to urban ornamental plants	—	—	Ozone ISA[2]
	Carbon sequestration in terrestrial ecosystems	—	—	Ozone ISA[3]
	Recreational demand associated with forest aesthetics	—	—	Ozone ISA[2]
	Other non-use effects	—	—	Ozone ISA[2]
	Ecosystem functions (e.g., water cycling, biogeochemical cycles, net primary productivity, leaf-gas exchange, community composition)	—	—	Ozone ISA[2]

[1] The climate and related impacts of CO_2 and methane (CH_4) emissions changes, such as sea level rise, are estimated within each integrated assessment model as part of the calculation of the domestic SC-CO_2 and SC-CH_4. The resulting monetized damages, which are relevant for conducting the benefit-cost analysis, are used in this RIA to estimate the domestic welfare effects of quantified changes in CH_4 emissions.
[2] We assess these benefits qualitatively because we do not have sufficient confidence in available data or methods.
[3] We assess these benefits qualitatively due to data limitations for this analysis, but we have quantified them in other analyses.
[4] We assess these benefits qualitatively because current evidence is only suggestive of causality or there are other significant concerns over the strength of the association.

2.3.2 Forgone Emissions Reductions

Oil and natural gas operations in the U.S. include a variety of emission points for methane, VOC, and HAP, including wells, well sites, processing plants, compressor stations, storage equipment, and transmission and distribution lines. These emission points are located throughout much of the country, though they are concentrated in particular geographic regions. For example, wells and processing plants are largely concentrated in the South Central, Midwest, and Southern California regions of the U.S., whereas natural gas compressor stations are located all over the country. Distribution lines to customers are frequently located within areas of high population density.

The Policy Review may result in forgone reductions in ambient $PM_{2.5}$ and ozone concentrations in areas attaining and not attaining the NAAQS. Due to the high degree of variability in the responsiveness of ozone and $PM_{2.5}$ formation to VOC emission reductions, we are unable to determine how this rule might affect attainment status without modeling air quality changes.[36] Because the NAAQS RIAs also calculate ozone and $PM_{2.5}$ benefits, there are important differences worth noting in the design and analytical objectives of each impact analysis. The NAAQS RIAs illustrate the potential costs and benefits of attaining new nationwide air quality standards based on an array of emission control strategies for different sources.[37] By contrast, the emission impacts of implementation rules, including the oil and natural gas NSPS, are generally from a specific class of well-characterized sources. In general, The EPA is more confident in the magnitude and location of the emission reductions for implementation rules rather than illustrative NAAQS analyses. Emission changes realized under these and other promulgated rules will ultimately be reflected in the baseline of future NAAQS analyses, which would affect the incremental benefits and costs associated with attaining future NAAQS.

Table 2-13 shows the total forgone emissions reductions projected under the Policy Review for the period of 2021 to 2030. The impacts of these pollutants accrue at different spatial scales. HAP emissions increase exposure to carcinogens and other toxic pollutants primarily near the emission source. VOC emissions are precursors to secondary formation of $PM_{2.5}$ and ozone on a broader regional scale. Climate effects associated with long-lived greenhouse gases like methane generally do not depend on the location of the emission of the gas and have global impacts. Methane is also a precursor to global background concentrations of ozone (Sarofim, 2015).

[36] The responsiveness of ozone and $PM_{2.5}$ formation is discussed in greater detail in Sections 2.3.4 and 2.3.5, respectively.

[37] NAAQS RIAs hypothesize, but do not predict, the control strategies States may choose to enact when implementing a NAAQS. The setting of a NAAQS does not directly result in costs or benefits, and as such, the NAAQS RIAs are merely illustrative and are not intended to be added to the costs and benefits of other regulations that result in specific costs of control and emission reductions. However, some benefits and costs estimated in this RIA may account for the same air quality improvements as estimated in an illustrative NAAQS RIA.

Table 2-13 Projected Total Forgone Emissions Reductions under the Policy Review, 2021 through 2030

Pollutant	Policy Review
Methane (short tons)	400,000
VOC (short tons)	11,000
HAP (short tons)	330
Methane (metric tons)	360,000
Methane (million metric tons CO_2 Eq.)	9

Table 2-14 shows the projected forgone reductions of methane, VOC, and HAP emissions under the Policy Review for each year from 2021 to 2030.

Table 2-14 Projected Annual Forgone Reductions of Methane, VOC, and HAP Emissions under the Policy Review, 2021 to 2030

	Policy Review		
Year	**Methane (metric tons)**	**VOC (short tons)**	**HAP (short tons)**
2021	20,000	610	18
2022	24,000	720	21
2023	27,000	830	25
2024	31,000	940	28
2025	34,000	1,000	31
2026	38,000	1,200	34
2027	41,000	1,300	37
2028	45,000	1,400	41
2029	48,000	1,500	44
2030	53,000	1,600	48
Total	**360,000**	**11,000**	**330**

Note: Estimates may not sum due to independent rounding.

2.3.3 Methane Climate Effects and Valuation

Methane is the principal component of natural gas. Methane is also a potent greenhouse gas (GHG) that, once emitted into the atmosphere, absorbs terrestrial infrared radiation, which in turn contributes to increased global warming and continuing climate change. Methane reacts in the atmosphere to form ozone, which also impacts global temperatures. Methane, in addition to other GHG emissions, contributes to warming of the atmosphere, which over time leads to increased air and ocean temperatures; changes in precipitation patterns; melting and thawing of global glaciers and ice sheets; increasingly severe weather events, such as hurricanes of greater intensity; and sea level rise, among other impacts.

According to the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (IPCC, 2013), changes in methane concentrations since 1750 contributed 0.48 W/m^2 of forcing, which is about 17 percent of all global forcing due to increases in anthropogenic GHG concentrations, and which makes methane the second leading long-lived climate forcer after CO_2. However, after accounting for changes in other greenhouse substances such as ozone and stratospheric water vapor due to chemical reactions of methane in the atmosphere, historical methane emissions were estimated to have contributed to 0.97 W/m^2 of forcing today, which is about 30 percent of the contemporaneous forcing due to historical greenhouse gas emissions.

The oil and natural gas sector emits significant quantities of methane. The U.S. Inventory of Greenhouse Gas Emissions and Sinks: 1990-2018 (published 2020) estimates 2018 methane emissions from Petroleum and Natural Gas Systems (not including petroleum refineries, petroleum transportation, and natural gas distribution) to be 171 million metric tons CO_2 Eq. In 2018, total methane emissions from the oil and natural gas industry represented 27 percent of the total methane emissions from all sources and account for about 3 percent of all CO_2 Eq. emissions in the U.S., with the combined petroleum and natural gas systems being the largest contributor to U.S. anthropogenic methane emissions (U.S. EPA, 2020).

To give a sense of the magnitude of the forgone methane emissions reduction under the Policy Review, the projected reductions for 2021 (0.5 million metric tons CO_2 Eq.) are equivalent to less than one percent of the methane emissions for this sector reported in the U.S. GHGI for 2018 (about 197 million metric tons CO_2 Eq. are from petroleum and natural gas production and gas processing, transmission, and storage). Expected forgone emission reductions in 2030 (about 1.3 million metric tons CO_2 Eq.) are also equivalent to less than one percent of 2017 emissions.

We estimate the forgone climate benefits under the finalized and alternative options using an interim measure of the domestic social cost of methane (SC-CH_4). The SC-CH_4 is an estimate of the monetary value of impacts associated with marginal changes in CH_4 emissions in a given year. It includes a wide range of anticipated climate impacts, such as net changes in agricultural productivity and human health, property damage from increased flood risk, and changes in energy system costs, such as reduced costs for heating and increased costs for air conditioning. It is typically used to assess the avoided damages as a result of regulatory actions (*i.e.*, benefits of rulemakings that lead to an incremental reduction in cumulative global CH_4 emissions). The SC-CH_4 estimates used in this analysis focus on the direct impacts of climate change that are anticipated to occur within U.S. borders.

The SC-CH_4 estimates presented here are interim values developed under E.O. 13783 for use in regulatory analyses until an improved estimate of the impacts of climate change to the U.S. can be developed based on the best available science and economics. E.O. 13783 directed agencies to ensure that estimates of the social cost of greenhouse gases used in regulatory analyses "are based on the best available science and economics" and are consistent with the guidance contained in OMB Circular A-4, "including with respect to the consideration of domestic versus international impacts and the consideration of appropriate discount rates" (E.O. 13783, Section 5(c)). In addition, E.O. 13783 withdrew the technical support documents (TSDs) and the August 2016 Addendum to these TSDs describing the global social cost of greenhouse gas estimates developed under the prior Administration as no longer representative of government policy. The withdrawn TSDs and Addendum were developed by an interagency working group (IWG) that included the EPA and other executive branch entities and were used in the 2016 NSPS RIA.

Regarding the two analytical considerations highlighted in E.O. 13783 – how best to consider domestic versus international impacts and appropriate discount rates – current guidance in OMB Circular A-4 is as follows. Circular A-4 states that analysis of economically significant proposed and final regulations "should focus on benefits and costs that accrue to citizens and residents of the United States." Because this action is economically significant as defined in E.O. 12866, Section 3(f)(1), we follow this guidance by adopting a domestic perspective in our central analysis. Regarding discount rates, Circular A-4 states that regulatory analyses "should provide estimates of net benefits using both 3 percent and 7 percent." The 7 percent rate is intended to represent the average before-tax rate of return to private capital in the U.S. economy. The 3 percent rate is intended to reflect the rate at which society discounts future consumption, which is particularly relevant if a regulation is expected to affect private consumption directly. The EPA follows this guidance below by presenting estimates based on both 3 and 7 percent discount rates in the main analysis. See Appendix B for a discussion the modeling steps involved in estimating the domestic SC-CH_4 estimates based on these discount rates.

The SC-CH_4 estimates developed under E.O. 13783 will be used in regulatory analysis until improved domestic estimates can be developed, which will take into consideration the recent recommendations from the National Academies of Sciences, Engineering, and Medicine (2017) for a comprehensive update to the current methodology to ensure that the social cost of greenhouse gas estimates reflect the best available science. While the Academies' review focused on the methodology to estimate the social cost of carbon (SC-CO_2), the recommendations on how to update many of the underlying modeling assumptions also pertain to the SC-CH_4 estimates since the framework used to estimate SC-CH_4 is the same as that used for SC-CO_2.

Table 2-15 presents the average domestic SC-CH_4 estimates across all the model runs for each discount rate for emissions occurring in 2021 to 2030. As with the global SC-CH_4 estimates, the domestic SC-CH_4 increases over time because future emissions are expected to produce larger incremental damages as physical and economic systems become more stressed in response to greater climatic change and because GDP is growing over time and many damage categories are modeled in proportion to gross GDP.

Table 2-15 Interim Domestic Social Cost of CH_4, 2021 to 2030 (in 2016$ per metric ton CH_4)[1]

	Discount Rate and Statistic	
Year	**7% Average**	**3% Average**
2021	58	180
2022	60	190
2023	63	190
2024	65	200
2025	68	200
2026	70	210
2027	73	220
2028	75	220
2029	78	230
2030	81	230

[1] SC-CH_4 values are stated in $/metric ton CH_4 and rounded to two significant digits. The estimates vary depending on the year of CH_4 emissions and are defined in real terms, *i.e.*, adjusted for inflation using the GDP implicit price deflator.

Table 2-16 presents the monetized forgone domestic climate benefits under the Policy Review. Projected forgone methane emissions reductions increases in methane emissions each year are multiplied by the SC-CH_4 estimate for that year. The table shows the annual forgone benefits discounted back to 2020 and the PV and the EAV for the 2021 to 2030 period under each discount rate. The PV of forgone benefits under a 7 percent discount rate is about $17 million, with an EAV of about $2.2 million per year. The PV of forgone benefits under a 3 percent discount rate of $63 million, with an EAV of about $7.2 million per year.

Table 2-16 Projected Forgone Domestic Climate Benefits under the Policy Review, 2021-2030 (millions, 2016$)

	Undiscounted		Discounted back to 2020	
Year	**7 percent**	**3 Percent**	**7 percent**	**3 Percent**
2021	$1.2	$3.6	$1.1	$3.5
2022	$1.4	$4.4	$1.2	$4.2
2023	$1.7	$5.2	$1.4	$4.8
2024	$2.0	$6.1	$1.5	$5.4
2025	$2.3	$7.0	$1.7	$6.0
2026	$2.7	$7.9	$1.8	$6.6
2027	$3.0	$8.9	$1.9	$7.2
2028	$3.4	$10	$2.0	$7.8
2029	$3.8	$11	$2.1	$8.4
2030	$4.2	$12	$2.2	$9.1
PV			**$17**	**$63**
EAV			**$2.2**	**$7.2**

Note: Estimates may not sum due to independent rounding.

The limitations and uncertainties associated with the global SC-CH_4 estimates, which were discussed in detail in the 2016 NSPS RIA, likewise apply to the forgone domestic SC-CH_4 estimates presented in this analysis.[38] Some uncertainties are captured within the analysis, as discussed in detail in Appendix B, while other areas of uncertainty have not yet been quantified in a way that can be modeled. For example, as with the methodology used to calculate SC-CO_2 estimates, limitations include incomplete or inadequate representation in the integrated assessment models of several important factors: catastrophic and non-catastrophic impacts, adaptation and technological change, inter-regional and inter-sectoral linkages, uncertainty in the extrapolation of damages to high temperatures, and the relationship between the discount rate and uncertainty in economic growth over long time horizons. The science incorporated into these models understandably lags the most recent research, and the limited amount of research linking climate impacts to economic damages makes the modeling exercise even more difficult.

[38] The SC-CH_4 estimates presented in the 2016 NSPS RIA are the same as the SC-CH_4 estimates presented in EPA-HQ-OAR-2015-0827-5886, "Addendum to Technical Support Document on Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12866: Application of the Methodology to Estimate the Social Cost of Methane and the Social Cost of Nitrous Oxide (August 2016)", except the estimates in the 2016 NSPS RIA were adjusted to 2012 dollar. The estimates published in the 2016 NSPS RIA were labeled as "Marten *et al*. (2014)" estimates. In addition, EPA-HQ-OAR-2015-0827-5886 provides a detailed discussion of the limitations and uncertainties associated with the SC-GHG estimates.

There are several limitations specific to the estimation of SC-CH_4. For example, the SC-CH_4 estimates do not reflect updates from the IPCC regarding atmospheric and radiative efficacy.[39] Another limitation is that the SC-CH_4 estimates do not account for the direct health and welfare impacts associated with tropospheric ozone produced by methane (see the 2016 NSPS RIA for further discussion). In addition, the SC-CH_4 estimates do not reflect that methane emissions lead to a reduction in atmospheric oxidants, like hydroxyl radicals, nor do they account for impacts associated with CO_2 produced from methane oxidizing in the atmosphere. See EPA-HQ-OAR-2015-0827-5886 for more detailed discussion about the limitations specific to the estimation of SC-CH_4. These individual limitations and uncertainties do not all work in the same direction in terms of their influence on the SC-CH4 estimates. In accordance with guidance in OMB Circular A-4 on the treatment of uncertainty, Appendix B provides a detailed discussion of the ways in which the modeling underlying the development of the SC-CH_4 estimates used in this analysis addresses quantified sources of uncertainty and presents a sensitivity analysis to show consideration of the uncertainty surrounding discount rates over long time horizons.

Recognizing the limitations and uncertainties associated with estimating the social cost of greenhouse gases, the research community has continued to explore opportunities to improve estimates of SC-CO_2 and other greenhouse gases. Notably, the National Academies of Sciences, Engineering, and Medicine conducted a multi-discipline, multi-year assessment to examine potential approaches, along with their relative merits and challenges, for a comprehensive update to the IWG methodology. The task was to ensure that the SC-CO_2 estimates that are used in Federal analyses reflect the best available science, focusing on issues related to the choice of models and damage functions, climate science modeling assumptions, socioeconomic and emissions scenarios, presentation of uncertainty, and discounting. In January 2017, the Academies released their final report, Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide,[40] and recommended specific criteria for future updates to the SC-CO_2 estimates, a modeling framework to satisfy the specified criteria, and both near-term

[39] The SC-CH_4 estimates used in the 2016 NSPS RIA served as the starting point to calculate the interim domestic estimates presented in this RIA. The 2016 NSPS RIA SC-CH_4 estimates were calculated in 2014 using atmospheric and radiative efficacy values that have since been updated by the IPCC.

[40] National Academies of Sciences, Engineering, and Medicine. 2017. *Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide.* National Academies Press. Washington, DC Available at https://www.nap.edu/catalog/24651/valuing-climate-damages-updating-estimation-of-the-social-cost-of/. Accessed April 26, 2020.

updates and longer-term research needs pertaining to various components of the estimation process (National Academies 2017). Since the framework used to estimate SC-CH_4 is the same as that used for SC-CO_2, the Academies' recommendations on how to update many of the underlying modeling assumptions also apply to the SC-CH_4 estimates.

The Academies' report also discussed the challenges in developing domestic SC-CO_2 estimates, noting that current IAMs do not model all relevant regional interactions—*e.g.*, how climate change impacts in other regions of the world could affect the United States, through pathways such as global migration, economic destabilization, and political destabilization. The Academies concluded that it "is important to consider what constitutes a domestic impact in the case of a global pollutant that could have international implications that impact the United States. More thoroughly estimating a domestic SC-CO_2 would therefore need to consider the potential implications of climate impacts on, and actions by, other countries, which also have impacts on the United States." (National Academies 2017, pg 12-13). This challenge is equally applicable to the estimation of a domestic SC-CH_4.

In addition to requiring reporting of domestic impacts, Circular A-4 states that when an agency "evaluate[s] a regulation that is likely to have effects beyond the borders of the United States, these effects should be reported separately" (page 15). This guidance is relevant to the valuation of damages from methane and other GHGs, given that GHGs contribute to damages around the world independent of the country in which they are emitted. Therefore, in accordance with this guidance in OMB Circular A-4, Appendix B presents the forgone global climate benefits under the Policy Review using global SC-CH_4 estimates based on both 3 and 7 percent discount rates. Note that the EPA did not quantitatively project the full impact of the 2012 and 2016 NSPS on international trade and the location of production, so it is not possible to present analogous estimates of global cost reductions resulting from the finalized action. However, to the extent that affected firms have some foreign ownership, some of the cost reductions accruing to entities outside U.S. borders is captured in the compliance cost reductions presented in this RIA.

2.3.4 VOC as an Ozone Precursor

This rulemaking may forgo emission reductions of VOC, which are a precursor to ozone. Ozone is not emitted directly into the air, but is created when its two primary components, VOC and oxides of nitrogen (NO_X), react in the atmosphere in the presence of sunlight. In urban areas, compounds representing all classes of VOC are important for ozone formation, but biogenic VOC emitted from vegetation tend to be more important compounds in non-urban vegetated areas (U.S. EPA, 2013). Forgone emission reductions may increase ozone formation, human exposure to ozone, and the incidence of ozone-related health effects. However, we have not quantified the ozone-related forgone benefits in this analysis due to the complex non-linear chemistry of ozone formation, which introduces uncertainty to the development and application of a benefit-per-ton estimate, particularly for sectors with substantial new growth. In addition, the impact of forgone VOC emission reductions is spatially heterogeneous and highly dependent on local air chemistry. Urban areas with a high population concentration are often VOC-limited, which means that ozone is most effectively reduced by lowering VOC. Rural areas and downwind suburban areas are often NO_X-limited, which means that ozone concentrations are most effectively reduced by lowering NO_X emissions, rather than lowering emissions of VOC. Between these areas, ozone is relatively insensitive to marginal changes in both NO_X and VOC.

Due to data limitations regarding potential locations of new, reconstructed, and modified sources affected by this rulemaking, we did not perform air quality modeling for this rule needed to quantify the forgone ozone benefits associated with forgone VOC emission reductions. Due to the high degree of variability in the responsiveness of ozone formation to VOC emissions and data limitations regarding the location of new, reconstructed, and modified well sites, we are unable to estimate the effect that forgone VOC emission reductions will have on ambient ozone concentrations without air quality modeling.[41]

2.3.4.1 Ozone Health Effects

Human exposure to ambient ozone concentrations is associated with adverse health effects, including premature mortality and cases of respiratory morbidity (U.S. EPA, 2010). Researchers have associated ozone exposure with adverse health effects in numerous toxicological, clinical and epidemiological studies (U.S. EPA, 2013). When adequate data and resources are available, the EPA has generally quantified several health effects associated with exposure to ozone (*e.g.*,

[41] EPA is working on improving our understanding of the effects of VOC emission reductions in the oil and natural gas sector.

U.S. EPA, 2010; U.S. EPA, 2011c). These health effects include respiratory morbidity, such as asthma attacks; hospital and emergency department visits; lost school days; and premature mortality. The scientific literature is also suggestive that exposure to ozone is also associated with chronic respiratory damage and premature aging of the lungs.

The EPA has previously estimated the ozone-related benefits of reducing VOC emissions from the industrial boiler sector (U.S. EPA, 2011b)[42] and in the RIA for the proposed Ozone NAAQS (U.S. EPA, 2014). While the benefit-per-ton estimates used to quantify impacts for those rules may provide useful context, the geographic distribution of VOC emissions from the oil and natural gas sector is not consistent with emissions modeled in either analysis. Therefore, we do not believe that those estimates are representative of the monetized forgone benefits of this rule, even as a bounding exercise.

2.3.4.2 Ozone Vegetation Effects

Exposure to ozone has been found to be associated with a wide array of vegetation and ecosystem effects in the published literature (U.S. EPA, 2013). Sensitivity to ozone is highly variable across species, with over 66 vegetation species identified as “ozone-sensitive”, many of which occur in state and national parks and forests. These effects include those that damage to, or impairment of, the intended use of the plant or ecosystem. Such effects are considered adverse to public welfare and can include reduced growth and/or biomass production in sensitive trees, reduced yield and quality of crops, visible foliar injury, changed to species composition, and changes in ecosystems and associated ecosystem services.

2.3.4.3 Ozone Climate Effects

Ozone is a well-known short-lived climate forcing GHG (U.S. EPA, 2013). Stratospheric ozone (the upper ozone layer) is beneficial because it protects life on Earth from the sun’s harmful ultraviolet (UV) radiation. In contrast, tropospheric ozone (ozone in the lower atmosphere) is a harmful air pollutant that adversely affects human health and the environment and contributes significantly to regional and global climate change. Due to its short atmospheric lifetime,

[42] While EPA has estimated the ozone benefits for many scenarios, most of those scenarios also reduce NO_2 emissions, which make it difficult to isolate the benefits attributable to VOC reductions.

tropospheric ozone concentrations exhibit large spatial and temporal variability (U.S. EPA, 2009b). The IPCC AR5 estimated that the contribution to current warming levels of increased tropospheric ozone concentrations resulting from human methane, NO_X, and VOC emissions was 0.5 W/m^2, or about 30 percent as large a warming influence as elevated CO_2 concentrations. This quantifiable influence of ground level ozone on climate leads to increases in global surface temperature and changes in hydrological cycles.

2.3.5 VOC as a $PM_{2.5}$ Precursor

This rulemaking is expected to result in forgone emission reductions of VOC, which are a precursor to $PM_{2.5}$, thus increasing human exposure to $PM_{2.5}$ and the incidence of $PM_{2.5}$-related health effects, although the magnitude of this effect cannot be quantified at this time. Most VOC emitted are oxidized to CO_2 rather than to PM, but a portion of VOC emission contributes to ambient $PM_{2.5}$ levels as organic carbon aerosols (U.S. EPA, 2009a). Analysis of organic carbon measurements suggest only a fraction of secondarily formed organic carbon aerosols are of anthropogenic origin. The current state of the science of secondary organic carbon aerosol formation indicates that anthropogenic VOC contribution to secondary organic carbon aerosol is often lower than the biogenic (natural) contribution and photochemical models typically estimate secondary organic carbon from anthropogenic VOC emissions to be less than 0.1 μg/m^3 (U.S. EPA, 2009a). Given that only a small fraction of secondarily formed organic carbon aerosols is from anthropogenic VOC emissions, it is unlikely that this sector has a large contribution to ambient secondary organic carbon aerosols. Therefore, we have not quantified the forgone $PM_{2.5}$-related benefits in this analysis.

2.3.5.1 $PM_{2.5}$ Health Effects

Increasing VOC emissions would increase secondary $PM_{2.5}$ formation, and, thus, the incidence of $PM_{2.5}$-related health effects. Increasing exposure to $PM_{2.5}$ is associated with significant human health detriments, including mortality and respiratory morbidity. Researchers have associated $PM_{2.5}$ exposure with adverse health effects in numerous toxicological, clinical and epidemiological studies (U.S. EPA, 2009a). These health effects include premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing (U.S. EPA, 2009a). These health effects result in hospital and ER visits, lost workdays, and restricted activity days. When adequate data and resources are available, The EPA has quantified the health effects associated with exposure to $PM_{2.5}$ (*e.g.*, U.S. EPA (2011c)).

When the EPA quantifies $PM_{2.5}$-related benefits, the Agency assumes that all fine particles, regardless of their chemical composition, are equally potent in causing premature mortality because the scientific evidence is not yet sufficient to allow differentiation of effect estimates by particle type (U.S. EPA, 2009a). Based on our review of the current body of scientific literature, the EPA estimates PM-related premature mortality without applying an assumed concentration threshold. This decision is supported by the data, which are quite consistent in showing effects down to the lowest measured levels of $PM_{2.5}$ in the underlying epidemiology studies.

2.3.5.2 Organic PM Welfare Effects

According to the residual risk assessment that the EPA performed for this sector (U.S. EPA, 2012a), persistent and bioaccumulative HAP reported as emissions from oil and natural gas operations include polycyclic organic matter (POM). POM defines a broad class of compounds that includes polycyclic aromatic hydrocarbon compounds (PAHs). Several significant ecological effects are associated with the deposition of organic particles, including persistent organic pollutants, and PAHs (U.S. EPA, 2009a). This summary is from Section 6.6.1 of the 2012 PM NAAQS RIA (U.S. EPA, 2012b).

PAHs can accumulate in sediments and bioaccumulate in freshwater, flora, and fauna. The uptake of organics depends on the plant species, site of deposition, physical and chemical properties of the organic compound and prevailing environmental conditions (U.S. EPA, 2009a). PAHs can accumulate to high enough concentrations in some coastal environments to pose an environmental health threat that includes cancer in fish populations, toxicity to organisms living in the sediment and risks to those (*e.g.*, migratory birds) that consume these organisms. Atmospheric deposition of particles is thought to be the major source of PAHs to the sediments of coastal areas of the U.S. Deposition of PM to surfaces in urban settings increases the metal and organic component of storm water runoff. This atmospherically associated pollutant burden can then be toxic to aquatic biota. The contribution of atmospherically deposited PAHs to aquatic food webs was demonstrated in high elevation mountain lakes with no other anthropogenic contaminant sources.

The Western Airborne Contaminants Assessment Project (WACAP) is the most comprehensive database available on contaminant transport and the effects of PM deposition on sensitive ecosystems in the Western U.S. (Landers *et al.*, 2008). In this project, the transport, fate, and ecological impacts of anthropogenic contaminants from atmospheric sources were assessed from 2002 to 2007 in seven ecosystem components (air, snow, water, sediment, lichen, conifer needles, and fish) in eight core national parks. The study concluded that bioaccumulation of semi-volatile organic compounds occurred throughout park ecosystems, that an elevational gradient in PM deposition exists with greater accumulation in higher altitude areas, and that contaminants accumulate in proximity to individual agriculture and industry sources, which is counter to the original working hypothesis that most of the contaminants would originate from Eastern Europe and Asia.

2.3.5.3 Visibility Effects

Increasing secondary formation of $PM_{2.5}$ from VOC emissions could reduce visibility throughout the U.S. Fine particles with significant light-extinction efficiencies include sulfates, nitrates, organic carbon, elemental carbon, and soil (Sisler, 1996). Suspended particles and gases degrade visibility by scattering and absorbing light. Higher visibility impairment levels in the East are due to higher concentrations of fine particles, particularly sulfates, and higher average relative humidity levels. Visibility impairment has a direct impact on people's enjoyment of daily activities and their overall sense of wellbeing. Good visibility increases the quality of life where individuals live and work, and where they engage in recreational activities. Previous analyses (U.S. EPA, 2006; U.S. EPA, 2011a; U.S. EPA, 2011c; U.S. EPA, 2012b) show that visibility benefits are a significant welfare benefit category. However, without air quality modeling, we are unable to estimate forgone visibility related benefits, nor are we able to determine whether forgone VOC emissions would be likely to have a significant impact on visibility in urban areas or Class I areas.

2.3.6 Hazardous Air Pollutants (HAP)

When looking at exposures from all air toxic sources of outdoor origin across the U.S., we see that emissions declined by approximately 60 percent since 1990. However, despite this decline, the 2014 National-Scale Air Toxics Assessment (NATA) predicts that some Americans are still exposed to ambient concentrations of air toxics at levels that have the potential to cause adverse health effects.[43] The levels of air toxics to which people are exposed vary depending on where they live and work and the kinds of activities in which they engage. In order to identify and prioritize air toxics, emission source types and locations that are of greatest potential concern, the EPA conducts the NATA.[44] The most recent NATA was conducted for calendar year 2014 and was released in August 2018. NATA includes four steps:

1) Compiling a national emissions inventory of air toxics emissions from outdoor sources;

2) Estimating ambient concentrations of air toxics across the U.S. using dispersion models;

3) Estimating population exposures across the U.S. using exposure models; and

4) Characterizing potential public health risk due to inhalation of air toxics including both cancer and noncancer effects.

Based on the 2014 NATA, the EPA estimates that less than 1 percent of census tracts nationwide have increased cancer risks greater than 100-in-1 million. The average national cancer risk is about 30-in-1 million. Nationwide, the key pollutants that contribute most to the overall cancer risks are formaldehyde and benzene.[45,46] Secondary formation (*e.g.*, formaldehyde forming from

[43] The 2014 NATA is available on the Internet at http://www.epa.gov/nata/. Accessed April 26, 2020.

[44] The NATA modeling framework has several limitations that prevent its use as the sole basis for setting regulatory standards. These limitations and uncertainties are discussed on the 2014 NATA website. Even so, this modeling framework is very useful in identifying air toxic pollutants and sources of greatest concern, setting regulatory priorities, and informing the decision-making process. U.S. EPA. (2018) 2014 National-Scale Air Toxics Assessment. http://www.epa.gov/nata/. Accessed April 26, 2020.

[45] Details on EPA's approach to characterization of cancer risks and uncertainties associated with the 2014 NATA risk estimates can be found at http://www.epa.gov/national-air-toxics-assessment/nata-limitations/ Accessed April 26, 2020.

[46] Details about the overall confidence of certainty ranking of the individual pieces of NATA assessments including both quantitative (*e.g.*, model-to-monitor ratios) and qualitative (*e.g.*, quality of data, review of emission inventories) judgments can be found at http://www.epa.gov/national-air-toxics-assessment/nata-limitations/ Accessed April 26, 2020.

other emitted pollutants) was the largest contributor to cancer risks, while stationary, mobile, biogenics, and background sources contribute lesser amounts to the remaining cancer risk.

Noncancer health effects can result from chronic,[47] subchronic,[48] or acute[49] inhalation exposure to air toxics, and include neurological, cardiovascular, liver, kidney, and respiratory effects as well as effects on the immune and reproductive systems. According to the 2014 NATA, less than 1 percent of the U.S. population was exposed to an average chronic concentration of air toxics that had the potential for adverse noncancer health effects. Results from the 2014 NATA indicate that acrolein is the primary respiratory driver for noncancer respiratory risk.

Figure 2-1 depicts the 2014 NATA estimated census tract-level carcinogenic risk from the assessment. It is important to note that increases in HAP emissions may not necessarily translate into significant increases in health risk because toxicity varies by pollutant, and exposures may or may not exceed levels of concern. For example, just a few pounds of some metals (*i.e.*, Hexavalent Chromium) is more toxic than a ton of benzene. However, the Integrated Risk Information System (IRIS) unit risk estimate (URE) for hexavalent chromium is considerably higher (more toxic) than that for benzene.[50] Thus, it is important to account for the toxicity and exposure, as well as the mass of the targeted emissions.

[47] Chronic exposure is defined in the glossary of the Integrated Risk Information System (IRIS) database (http://www.epa.gov/iris) as repeated exposure by the oral, dermal, or inhalation route for more than approximately 10 of the life span in humans (more than approximately 90 days to 2 years in typically used laboratory animal species).

[48] Defined in the IRIS database as repeated exposure by the oral, dermal, or inhalation route for more than 30 days, up to approximately 10 of the life span in humans (more than 30 days up to approximately 90 days in typically used laboratory animal species).

[49] Defined in the IRIS database as exposure by the oral, dermal, or inhalation route for 24 hours or less.

[50] Details on the derivation of IRIS values and available supporting documentation for individual chemicals (as well as chemical values comparisons) can be found at http://www.epa.gov/iris/. Accessed April 26, 2020.

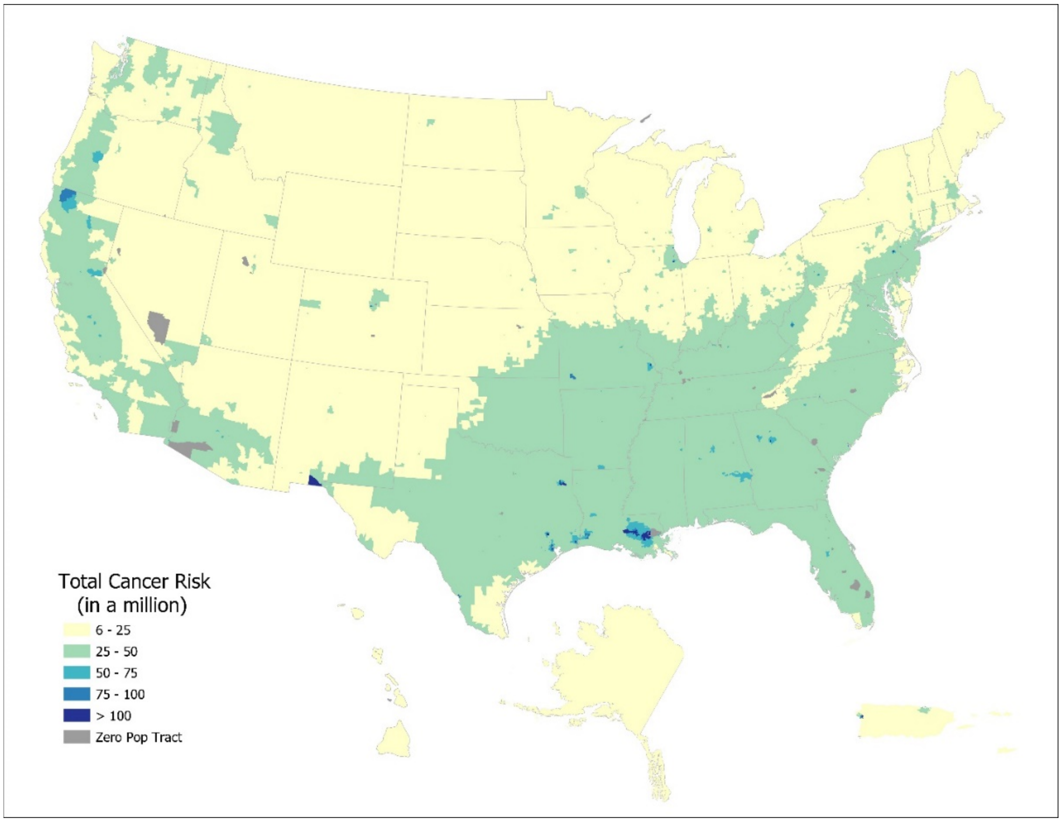

Figure 2-1 2014 NATA Model Estimated Census Tract Carcinogenic Risk from HAP Exposure from All Outdoor Sources based on the 2014 National Emissions Inventory

Due to methodology and data limitations, we were unable to estimate the benefits or disbenefits associated with the hazardous air pollutant emissions changes that could occur as a result of this rule. In a few previous analyses of the benefits of reductions in HAP, the EPA has quantified the benefits of potential reductions in the incidences of cancer and noncancer risk (*e.g.*, U.S. EPA, 1995). In those analyses, The EPA relied on unit risk estimate (URE) and reference concentrations (RfC) developed through risk assessment procedures. The URE is a quantitative estimate of the carcinogenic potency of a pollutant, often expressed as the probability of contracting cancer from a 70-year lifetime continuous exposure to a concentration of one $\mu g/m^3$ of a pollutant. These UREs are designed to be conservative, and as such, are more likely to represent the high end of the distribution of risk rather than a best or most likely estimate of risk. An RfC is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious noncancer health effects during a lifetime. As the purpose of a forgone benefit analysis is to describe the benefits most likely to result from a forgone reduction in pollution, use of high-end, conservative risk estimates would overestimate the forgone benefits of the regulation. While we used high-end risk estimates in past analyses, advice from the EPA's Science Advisory Board (SAB) recommended that we avoid using high-end estimates in benefit analyses (U.S. EPA-SAB, 2002). Since that time, the EPA has continued to develop better methods for analyzing the benefits of reductions in HAP.

As part of the second prospective analysis of the benefits and costs of the Clean Air Act (U.S. EPA, 2011a), the EPA conducted a case study analysis of the health effects associated with reducing exposure to benzene in Houston from implementation of the Clean Air Act (IEc, 2009). While reviewing the draft report, the EPA's Advisory Council on Clean Air Compliance Analysis concluded that "the challenges for assessing progress in health improvement as a result of reductions in emissions of hazardous air pollutants (HAP) are daunting...due to a lack of exposure-response functions, uncertainties in emissions inventories and background levels, the difficulty of extrapolating risk estimates to low doses and the challenges of tracking health progress for diseases, such as cancer, that have long latency periods" (U.S. EPA-SAB, 2008).

In summary, monetization of the forgone benefits of reductions in cancer incidences requires several important inputs, including central estimates of cancer risks, estimates of exposure to carcinogenic HAP, and estimates of the value of an avoided case of cancer (fatal and non-fatal). Due to methodology and data limitations, we did not attempt to monetize the forgone health benefits of forgone reductions in HAP in this analysis. Instead, we are providing a qualitative analysis of the health effects associated with the HAP anticipated to be forgone by this rule. The EPA remains committed to improving methods for estimating HAP benefits by continuing to explore additional concepts of benefits, including changes in the distribution of risk.

Available emissions data show that several different HAP are emitted from oil and natural gas operations, either from equipment leaks, processing, compressing, transmission and distribution, or storage tanks. Emissions of eight HAP make up a large percentage of the total HAP emissions by mass from the oil and natural gas sector: toluene, hexane, benzene, xylenes (mixed), ethylene glycol, methanol, ethyl benzene, and 2,2,4-trimethylpentane (U.S. EPA, 2012a). In the subsequent sections, we describe the health effects associated with the main HAP of concern from the oil and natural gas sector: benzene, toluene, carbonyl sulfide, ethylbenzene, mixed xylenes, and n-hexane. This rule is anticipated to result an increase of a total of 370 tons of HAP emissions over 2021 through 2030. With the data available, it was not possible to estimate the change in emissions of each individual HAP.

2.3.6.1 Benzene

The EPA's IRIS database lists benzene as a known human carcinogen (causing leukemia) by all routes of exposure, and concludes that exposure is associated with additional health effects, including genetic changes in both humans and animals and increased proliferation of bone marrow cells in mice (U.S EPA, 2000; IARC 1982; Irons, 1992). The EPA states in its IRIS database that data indicate a causal relationship between benzene exposure and acute lymphocytic leukemia and suggest a relationship between benzene exposure and chronic non-lymphocytic leukemia and chronic lymphocytic leukemia. The International Agency for Research on Carcinogens (IARC) has determined that benzene is a human carcinogen and the U.S. Department of Health and Human Services has characterized benzene as a known human carcinogen (IARC, 1987; NTP, 2004). Several adverse noncancer health effects including blood disorders, such as preleukemia and aplastic anemia, have also been associated with long-term exposure to benzene (Aksoy, 1989; Goldstein, 1988).

2.3.6.2 Toluene[51]

Under the 2005 Guidelines for Carcinogen Risk Assessment, there is inadequate information to assess the carcinogenic potential of toluene because studies of humans chronically exposed to toluene are inconclusive, toluene was not carcinogenic in adequate inhalation cancer bioassays of rats and mice exposed for life, and increased incidences of mammary cancer and leukemia were reported in a lifetime rat oral bioassay.

The central nervous system (CNS) is the primary target for toluene toxicity in both humans and animals for acute and chronic exposures. CNS dysfunction (which is often reversible) and narcosis have been frequently observed in humans acutely exposed to low or moderate levels of

[51] All health effects language for this section came from: U.S. EPA. 2005. "Full IRIS Summary for Toluene (CASRN 108-88-3)" Environmental Protection Agency, Integrated Risk Information System (IRIS), Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH. Available at http://www.epa.gov/iris/subst/0118.ht/. Accessed April 26, 2020.

toluene by inhalation: symptoms include fatigue, sleepiness, headaches, and nausea. Central nervous system depression has been reported to occur in chronic abusers exposed to high levels of toluene. Symptoms include ataxia, tremors, cerebral atrophy, nystagmus (involuntary eye movements), and impaired speech, hearing, and vision. Chronic inhalation exposure of humans to toluene also causes irritation of the upper respiratory tract, eye irritation, dizziness, headaches, and difficulty with sleep.

Human studies have also reported developmental effects, such as CNS dysfunction, attention deficits, and minor craniofacial and limb anomalies, in the children of women who abused toluene during pregnancy. A substantial database examining the effects of toluene in subchronic and chronic occupationally exposed humans exists. The weight of evidence from these studies indicates neurological effects (*i.e.*, impaired color vision, impaired hearing, decreased performance in neurobehavioral analysis, changes in motor and sensory nerve conduction velocity, headache, and dizziness) as the most sensitive endpoint.

2.3.6.3 Carbonyl Sulfide

Limited information is available on the health effects of carbonyl sulfide. Acute (short-term) inhalation of high concentrations of carbonyl sulfide may cause narcotic effects and irritate the eyes and skin in humans.[52] No information is available on the chronic (long-term), reproductive, developmental, or carcinogenic effects of carbonyl sulfide in humans. Carbonyl sulfide has not undergone a complete evaluation and determination under U.S. EPA's IRIS program for evidence of human carcinogenic potential.[53]

2.3.6.4 Ethylbenzene

Ethylbenzene is a major industrial chemical produced by alkylation of benzene. The pure chemical is used almost exclusively for styrene production. It is also a constituent of crude

[52] Hazardous Substances Data Bank (HSDB), online database. US National Library of Medicine, Toxicology Data Network, available online at https://pubchem.ncbi.nlm.nih.gov/. Carbonyl sulfide health effects summary available at https://pubchem.ncbi.nlm.nih.gov/compound/10039#section=Safety-and-Hazards. Accessed April 26, 2020.

[53] U.S. Environmental Protection Agency (U.S. EPA). 2000. Integrated Risk Information System File for Carbonyl Sulfide. Research and Development, National Center for Environmental Assessment, Washington, DC. This material is available electronically at http://www.epa.gov/iris/subst/0617.htm/. Accessed April 26, 2020.

petroleum and is found in gasoline and diesel fuels. Acute (short-term) exposure to ethylbenzene in humans results in respiratory effects such as throat irritation and chest constriction, and irritation of the eyes, and neurological effects such as dizziness. Chronic (long-term) exposure of humans to ethylbenzene may cause eye and lung irritation, with possible adverse effects on the blood. Animal studies have reported effects on the blood, liver, and kidneys and endocrine system from chronic inhalation exposure to ethylbenzene. No information is available on the developmental or reproductive effects of ethylbenzene in humans, but animal studies have reported developmental effects, including birth defects in animals exposed via inhalation. Studies in rodents reported increases in the percentage of animals with tumors of the nasal and oral cavities in male and female rats exposed to ethylbenzene via the oral route (Maltoni, 1985, Maltoni, 1997). The reports of these studies lacked detailed information on the incidence of specific tumors, statistical analysis, survival data, and information on historical controls, thus the results of these studies were considered inconclusive by the International Agency for Research on Cancer (IARC, 2000) and the National Toxicology Program (NTP, 1999). The NTP (1999) carried out a chronic inhalation bioassay in mice and rats and found clear evidence of carcinogenic activity in male rats and some evidence in female rats, based on increased incidences of renal tubule adenoma or carcinoma in male rats and renal tubule adenoma in females. NTP (1999) also noted increases in the incidence of testicular adenoma in male rats. Increased incidences of lung alveolar/bronchiolar adenoma or carcinoma were observed in male mice and liver hepatocellular adenoma or carcinoma in female mice, which provided some evidence of carcinogenic activity in male and female mice (NTP, 1999). IARC (2000) classified ethylbenzene as Group 2B, possibly carcinogenic to humans, based on the NTP studies.

2.3.6.5 Mixed Xylenes

Short-term inhalation of mixed xylenes (a mixture of three closely-related compounds) in humans may cause irritation of the nose and throat, nausea, vomiting, gastric irritation, mild transient eye irritation, and neurological effects (U.S. EPA, 2003). Other reported effects include labored breathing, heart palpitation, impaired function of the lungs, and possible effects in the liver and kidneys (ATSDR, 2007). Long-term inhalation exposure to xylenes in humans has been associated with a number of effects in the nervous system including headaches, dizziness, fatigue, tremors, and impaired motor coordination (ATSDR, 2007). The EPA has classified mixed xylenes in Category D, not classifiable with respect to human carcinogenicity.

2.3.6.6 n-Hexane

The studies available in both humans and animals indicate that the nervous system is the primary target of toxicity upon exposure of n-hexane via inhalation. There are no data in humans and very limited information in animals about the potential effects of n-hexane via the oral route. Acute (short-term) inhalation exposure of humans to high levels of hexane causes mild central nervous system effects, including dizziness, giddiness, slight nausea, and headache. Chronic (long-term) exposure to hexane in air causes numbness in the extremities, muscular weakness, blurred vision, headache, and fatigue. Inhalation studies in rodents have reported behavioral effects, neurophysiological changes and neuropathological effects upon inhalation exposure to n-hexane. Under the Guidelines for Carcinogen Risk Assessment (U.S. EPA, 2005), the database for n-hexane is considered inadequate to assess human carcinogenic potential, therefore The EPA has classified hexane in Group D, not classifiable as to human carcinogenicity.

2.3.6.7 Other Air Toxics

In addition to the compounds described above, other toxic compounds might be affected by this rule, including hydrogen sulfide (H_2S). Information regarding the health effects of those compounds can be found in the EPA's IRIS database.[54]

2.4 Economic Impacts and Distributional Assessments

This section includes four sets of discussion for this final action: energy markets impacts, distributional impacts, small business impacts, and employment impacts.

2.4.1 Energy Markets Impacts

As it is implemented, the 2016 NSPS OOOOa may have impacts on energy production and markets, which would be reduced by the finalized Policy Review. For the 2016 NSPS RIA, The EPA used the National Energy Modeling System (NEMS) to project drilling activity, price, and

[54] U.S. EPA Integrated Risk Information System (IRIS) database is available at www.epa.gov/iris. Accessed April 26, 2020

quantity changes in the production of crude oil and natural gas, and changes in international trade of crude oil and natural gas national energy markets as a result of the 2016 NSPS OOOOa.[55] In that analysis, the EPA estimated the following impacts under the final 2016 NSPS OOOOa:

- Natural gas and crude oil drilling levels would decline slightly over the 2020 to 2025 period (by about 0.17 percent for natural gas wells and 0.02 percent for crude oil wells);
- Crude oil production would not change appreciably under the rule, while natural gas production would decline slightly over the 2020 to 2025 period (about 0.03 percent);
- Crude oil wellhead prices for onshore production in the lower 48 states were not estimated to change appreciably over the 2020 to 2025 period, while wellhead natural gas prices for onshore production in the lower 48 states were estimated to increase slightly over the 2020 to 2025 period (about 0.20 percent); and,
- Net imports of natural gas were estimated to increase slightly in 2020 (by about 0.12 percent) and in 2025 (by about 0.11 percent), while net imports of crude oil were not estimated to change appreciably over the 2020 to 2025 period.

As described earlier in this RIA, this final action removes requirements in the 2016 NSPS OOOOa for sources in the transmission and storage segment. The finalized Policy Review is expected to lead to cost reductions compared to the baseline. As a result, the EPA expects this final action to reduce the impacts associated with the 2016 NSPS.

2.4.2 Distributional Impacts

The cost reductions and forgone benefits presented above are not expected to be distributed uniformly across the population. OMB recommends including a description of distributional effects in regulatory analysis, "so that decision makers can properly consider them along with the effects on economic efficiency [*i.e.*, net benefits]. Executive Order 12866 authorizes this approach." (U.S. Office of Management and Budget 2003). Understanding the distribution of the compliance cost reductions and forgone benefits can reveal community-level impacts associated

[55] See Section 6.2 of the 2016 NSPS RIA.

with regulatory actions. This section discusses the general expectations regarding how cost reductions might be distributed across affected entities and how forgone health benefits might be distributed across the U.S. informed by a review of recent literature. The EPA did not conduct a quantitative assessment of these distributional impacts for the final Policy Review, but this section provides a qualitative discussion of the types of distributional impacts that could result from this final action.

2.4.2.1 Distributional Aspects of Compliance Cost Reductions

The compliance costs associated with an environmental regulation can impact households by raising the prices of goods and services; the extent of the price increase depends on if and how producers pass-through those costs to consumers. The literature evaluates the distributional effects of introducing a new regulation; for this action, which is deregulatory, these effects can generally be interpreted in reverse. Expenditures on energy are usually a larger share of low-income household income than that of other households, and this share falls as income increases. Therefore, policies that increase energy prices have been found to be regressive, placing a relatively higher burden on lower income households (*e.g.*, Burtraw et al., 2009; Hassett et al., 2009; Williams et al. 2015). However, compliance costs will not be solely passed on in the form of higher energy prices, but also through lower labor earnings and returns to capital in the sector. Changes in employment associated with lower labor earnings can have distributional consequences depending on several factors (Section 2.4.4 discusses employment effects further). Capital income tends to make up a greater proportion of overall income for high income households. As a result, the costs passed through to households via lower returns to capital tend to be progressive, placing a greater share of the burden on higher income households in these instances (Rausch et al., 2011; Fullerton et al., 2012).

The ultimate distributional outcomes of a regulation will depend on how changes in energy prices and lower returns to labor and capital propagate through the economy and interact with existing government transfer programs. Some studies that use economy-wide frameworks find that the overall distribution of compliance costs could be progressive for some policies due to the changes in capital payments and the expectation that existing government transfer indexed to inflation will offset the burden to lower income households (Fullerton et al., 2011; Blonz et al., 2012).[56] However, others have found the distribution of compliance costs to be regressive due to a dominating effect of changes in energy prices to consumers (Fullerton 2011; Burtraw, et. al., 2009; Williams, et al., 2015). There may also be significant heterogeneity in the costs borne by individuals within income deciles (Rausch et al., 2011; Cronin et al., 2019). Different classifications of households, such as those based on lifetime income rather than contemporaneous annual income, may indicate notably different results in a distributional analysis (Fullerton and Metcalf, 2002; Fullerton et al., 2011). Furthermore, there may be important regional differences in the incidence of regulations. There are differences in the composition of goods consumed, regional production methods, the stringency of a rule, as well as the location of affected labor and capital ownership (the latter of which may be foreign-owned) (*e.g.* Caron et al. 2017; Hassett et al. 2009).

2.4.2.2 Distributional Aspects of the Forgone Health Benefits

This section discusses the distribution of forgone health benefits that result from the final Policy Review. The EPA guidance directs analysts to first consider the distribution of impacts in the baseline, prior to any regulatory action (U.S. EPA 2016). Often the baseline incidence of health problems is higher in low-income or minority populations due to a variety of factors, including the tendency for more pollution sources to be located in areas where low-income and minority populations live, work, and play (Bullard, et al. 2007; United Church of Christ 1987); greater susceptibility to a given exposure level due to physiology or other triggers (Akinbami 2012); and higher incidence of pre-existing conditions (Schwartz et al 2011). EPA (2016) recommends analysts examine the distribution of health impacts under the regulatory options being considered. Finally, after assessing the differences between the baseline and policy scenario, analysts should take note of whether the action ameliorates or exacerbates any pre-existing disparities.

Because regulatory health impacts are distributed based on the degree to which housing and work locations overlap geographically with areas where atmospheric concentrations of pollutants

[56] The incidence of government transfer payments (*e.g.*, Social Security) is generally progressive because these payments represent a significant source of income for lower income deciles and only a small source for high income deciles. Government transfer programs are often, implicitly or explicitly, indexed to inflation. For example, Social Security payments and veterans' benefits are adjusted every year to account for changes in prices (*i.e.*, inflation).

change, it is difficult to fully know the distributional impacts of a rule. Air dispersion models provide some information on changes in air quality induced by regulation, but it may be difficult to identify the characteristics of populations in those affected areas, as well as to perform local air dispersion modeling nationwide. Furthermore, the overall distribution of health benefits will depend on whether and how households engage in averting behaviors in response to changes in air quality, *e.g.*, by moving or changing the amount of time spent outside (Sieg et al., 2004).

2.4.3 Small Business Impacts

The Regulatory Flexibility Act (RFA; 5 U.S.C. §601 et seq.), as amended by the Small Business Regulatory Enforcement Fairness Act (Public Law No. 104121), requires that whenever an agency publishes a proposed rule, it must prepare and make available an initial regulatory flexibility analysis (IRFA), unless it certifies that the rule, if promulgated, will not have a significant economic impact on a substantial number of small entities (5 U.S.C. §605[b]). Small entities include small businesses, small organizations, and small governmental jurisdictions. An IRFA describes the economic impact of the rule on small entities and any alternative options that would accomplish the objectives of the rule while minimizing economic impacts on small entities.

An agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, has no net burden or otherwise has a positive economic effect on the small entities subject to the rule. As the Policy Review eliminates the regulatory requirements of the oil and natural gas sector NSPS for all transmission and storage sources, we have concluded that this final action will relieve regulatory burden for affected small entities in the transmission and storage segment that would otherwise be subject to requirements under the baseline.

2.4.4 Employment Impacts

We analyzed the impacts of the Policy Review on employment, which are discussed in this section.[57] This analysis uses detailed engineering information on labor requirements for the

[57] The employment analysis in this RIA is part of the EPA's ongoing effort to "conduct continuing evaluations of potential loss or shifts of employment which may result from the administration or enforcement of [the Act]" pursuant to CAA section 321(a).

rescinded provisions in order to estimate partial employment impacts for affected entities in the oil and natural gas industry. These bottom-up, engineering-based estimates represent only one portion of potential employment impacts within the regulated industry and do not represent estimates of the *net* employment impacts of this rule. Due to data and methodological limitations, other potential employment impacts in the affected industry and impacts in related industries could not be estimated. First, this section presents an overview of the various ways that environmental regulation can affect employment. The EPA continues to explore the relevant theoretical and empirical literature and to seek public comments in order to ensure that the way the EPA characterizes the employment effects of its regulations is reasonable and informative. The section concludes with estimates of partial employment impacts based on engineering-based information for labor requirements.

2.4.4.1 Employment Impacts of Environmental Regulation

E.O. 13777 directs federal agencies to consider a variety of issues regarding the characteristics and impacts of regulations, including the effect of regulations on jobs (Executive Order 13777). Employment impacts of environmental regulations are composed of a mix of potential declines and gains in different areas of the economy over time. Regulatory employment impacts can vary across occupations, regions, and industries; by labor demand and supply elasticities; and in response to other labor market conditions. Isolating such impacts is a challenge, as they are difficult to disentangle from employment impacts caused by a wide variety of ongoing, concurrent economic changes.

Environmental regulation "typically affects the distribution of employment among industries rather than the general employment level" (Arrow *et. al.* 1996). Even if impacts are small after long-run market adjustments to full employment, many regulatory actions have transitional effects in the short run (OMB, 2015). These movements of workers in and out of jobs in response to environmental regulation are potentially important and of interest to policymakers. Transitional job losses have consequences for workers that operate in declining industries, have limited capacity to migrate, or live in communities or regions with high unemployment rates.

As rescinding the oil and natural gas NSPS for transmission and storage segment is likely to cause little change in oil and natural gas exploration and production (and the production and processing segment continues to be regulated by the NSPS), demand for labor employed in exploration and production and associated industries is unlikely to change much, if at all. For affected oil and natural gas entities, some may reduce the labor they allocate to compliance-related activities associated with the now-rescinded oil and natural gas NSPS requirements for the transmission and storage segment.

2.4.4.2 Estimates of Reduction in Labor Required to Comply

The focus of this part of the analysis is on changes in the compliance-related labor requirements resulting from the removal of the requirements for the transmission and storage segment from the oil and natural gas NSPS. This analysis estimates the incremental change in labor required to satisfy environmental mitigation requirements as well as reporting and recordkeeping requirements due to the rescission of requirements for transmission and storage sources. Most of the estimated change in labor requirements relative to the baseline come from rescinding the fugitive emissions program for compressor stations in the transmission and storage segment.

The labor information is based on the cost analysis presented in the TSD that supports this rule. The labor estimates include labor associated with company-level activities and activities at field sites. Company-level activities included one-time “up-front” activities such as planning the company’s fugitive emissions program and annual requirements such as reporting and recordkeeping. Field-level activities included inspection and repair of leaks.

Table 2-17 presents the incremental change in labor required to comply with the NSPS due to the Policy Review at the facility level in hours per facility per year. The change in estimates for each of the facility types reflect the following changes from the baseline:

- **Compressor Stations** (in transmission and storage segment): removal of quarterly fugitives monitoring requirements.
- **Reciprocating Compressors:** removal of requirement to replace rod-packing every 36 months, or 26,000 hours.
- **Pneumatic Controllers:** removal of requirement to replace high-bleed controllers with low-bleed controllers.

Table 2-17 Changes in Labor Required to Comply at the Impacted Facility-Level

Facility	Upfront Labor Estimate (hours per facility)			Annual Labor Estimate (hours per facility per year)		
	Under the Baseline	Under Final Policy Review	Incremental Change	Under the Baseline	Under Final Policy Review	Incremental Change
Compressor Stations						
Transmission	64	0	-64	123.2	0	-123.2
Storage	64	0	-64	227.4	0	-227.4
Compressors						
Reciprocating	1	0	-1	1	0	-1
Pneumatic Controllers	0	0	0	0	0	0

Table 2-18 and Table 2-19 present estimates of the decrease in upfront and annual labor requirements, respectively. The estimates are presented in full-time equivalent (FTE) units in these tables; in this analysis we assume one FTE equals 2,080 hours (the product of 40 hours per week over 52 weeks). Note that reductions in labor requirements increase from 2021 to 2030 as the number of sites that would have been regulated under the NSPS under the baseline accumulates.

Table 2-18 Estimates of the Decrease in Upfront Labor Required (in FTEs) under the Policy Review, 2021-2030

	Compressor Stations					
	Transmission	Storage	Reciprocating Compressors	Pneumatic Controllers	Recordkeeping and Reporting	Total
2021	0.06	1.1	0.07	0	0	1.2
2022	0.06	1.1	0.07	0	0	1.2
2023	0.12	2.2	0.11	0	0	2.4
2024	0.12	2.2	0.11	0	0	2.4
2025	0.12	2.2	0.11	0	0	2.4
2026	0.12	2.2	0.11	0	0	2.4
2027	0.12	2.2	0.15	0	0	2.5
2028	0.12	2.2	0.15	0	0	2.5
2029	0.12	2.2	0.15	0	0	2.5
2030	0.12	2.2	0.15	0	0	2.5

Note: Full-time equivalents (FTE) are estimated by first multiplying the projected number of affected units by the per unit labor requirements and then multiplying by 2,080 (40 hours multiplied by 52 weeks). Estimates may not sum due to independent rounding.

Table 2-19 Estimates of the Decrease in Annual Labor Required (in FTEs) under the Policy Review, 2021-2030

	Compressor Stations					
Year	Transmission	Storage	Reciprocating Compressors	Pneumatic Controllers	Recordkeeping and Reporting	Total
2021	0.8	28	0.26	0	1.7	30
2022	1.0	31	0.29	0	1.8	35
2023	1.1	35	0.33	0	1.9	39
2024	1.2	39	0.37	0	2.0	43
2025	1.3	43	0.40	0	2.1	47
2026	1.4	47	0.44	0	2.3	51
2027	1.5	51	0.48	0	2.4	56
2028	1.7	55	0.51	0	2.5	60
2029	1.8	59	0.55	0	2.6	64
2030	1.9	63	0.58	0	2.7	68

Note: Full-time equivalents (FTE) are estimated by first multiplying the projected number of affected units by the per unit labor requirements and then multiplying by 2,080 (40 hours multiplied by 52 weeks). Estimates may not sum due to independent rounding.

The total incremental reductions in up-front labor requirements among entities affected by the Policy Review are projected to increase from 1.2 FTE in 2021 to 2.5 FTE in 2030. The total incremental reductions in annual labor requirements are projected to increase from about 30 to 68 FTEs from 2021 to 2030.

We note that this type of FTE estimate cannot be used to identify the specific number of employees involved or whether new jobs are created for new employees, versus displacing jobs from other sectors of the economy. As stated earlier, this rule is expected to result in little change in oil and natural gas exploration and production and is not expected to result in significant reductions to employment dedicated to these tasks. For the affected oil and natural gas entities, some reductions in compliance-related labor may be expected due to the rescission of requirements for transmission and storage segment under the Policy Review. We did not estimate any potential changes in labor outside of the affected sector. For example, no estimates of labor requirements for manufacturing pollution control equipment, or for producing the materials used in that equipment, are provided as the EPA did not have the information necessary for estimating broader employment impacts.

2.5 Comparison of Benefits and Costs

2.5.1 Comparison of Benefits and Costs

In this section, we present a comparison of the benefits and costs for the Policy Review. Here, we refer to the compliance cost reductions as the "benefits" and the forgone benefits as the "costs" of this action. The net benefits are the benefits (compliance cost reductions) minus the costs (forgone benefits). All benefits, costs, and net benefits shown in this section are presented as the PV of the costs and benefits of the Policy Review from 2021 through 2030 discounted back to 2020 using 7 and 3 discount rates. We also present the associated EAV under each discount rate.

Table 2-20 shows the projected benefits, costs, and net benefits for the Policy Review. Table 2-21 provides a summary of the projected forgone emissions reductions for this action.

Table 2-20 Present Value (PV) and Equivalent Annualized Value (EAV) of Forgone Monetized Benefits, Cost Reductions, and Net Benefits for the Policy Review, 2021 through 2030 (millions, 2016$)

	7 percent		3 percent	
	PV	EAV	PV	EAV
Benefits (Total Cost Reductions)	$31	$4.1	$38	$4.3
Cost Reductions	$67	$8.9	$83	$9.4
Forgone Value of Product Recovery	$36	$4.7	$45	$5.1
Costs (Forgone Domestic Climate Benefits)[1]	$17	$2.2	$63	$7.2
Net Benefits	$14	$1.9	-$25	-$2.9

Note: Estimates may not sum due to independent rounding.
[1] The forgone benefits estimates are calculated using estimates of the social cost of methane (SC-CH_4). SC-CH_4 values represent only a partial accounting of domestic climate impacts from methane emissions.

Table 2-21 Summary of Forgone Emission Reductions for the Policy Review, 2021 through 2030

Pollutant	Policy Review
Methane (short tons)	400,000
VOC (short tons)	11,000
HAP (short tons)	330
Methane (metric tons)	360,000
Methane (million metric tons CO_2 Eq.)	9.0

2.5.2 Uncertainties and Limitations

Throughout the RIA, we considered several sources of uncertainty, both quantitatively and qualitatively, regarding the forgone emissions reductions, forgone benefits, and cost reductions estimated for the final Policy Review. We summarize the key elements of our discussions of uncertainty follow.

Source-level compliance costs and emissions impacts: As discussed in Section 2.2.2, the first step in the compliance cost analysis is the development of per-facility national-average representative costs and emissions impacts using a model plant approach. The model plants are designed based upon the best information available to the Agency at the time of the rulemaking. By emphasizing facility averages, geographic variability and heterogeneity across producers in the industry is masked, and regulatory impacts at the facility-level may vary from the model plant averages.

Projection methods and assumptions: As discussed in Section 2.2.2 and 2.2.3, the second step in estimating national impacts is the projection of affected facilities. Uncertainties in the projections informing this chapter include: 1) choice of projection method; 2) data sources and drivers; 3) limited information about rate of modification and turnover of sources; 4) behavioral responses to regulation; and 5) unforeseen changes in industry and economic shocks.

The projection methods significantly impact affected facility projections. For example, some facility types were projected using extrapolations of historical trends from GHGI data, while other facility types were changed to be projected based on compliance report information. These two methods may result in divergent projections. In addition, a given methodology can be sensitive to regular updates or methodological revisions in the source data; for example, past updates to the GHGI have resulted in significant changes to the projections.

Some impacts of this rule are based on projections based on historical estimates in the GHGI and do not account for modifications or turnover, just the estimated number of new sources. To the extent actual counts of new facilities in transmission and storage diverge from the historical average annual increases, the regulatory impacts estimated in this document will be inaccurate.

Additionally, some emissions reducing technologies have become common industry practice under the oil and natural gas sector NSPS, such as the use of dry seals on centrifugal compressors. However, by removing regulatory requirements, there may be incentives to reduce use of these technologies, introducing uncertainties in how regulated entities may respond both directly and indirectly to the removal of NSPS requirements.

The projections do not account for potential changes in technological progress in the oil and gas industry. Additionally, unforeseen economic shocks may affect the impacts of the rule, such as unexpected periods of economic growth or recessions. For example, the projections in this RIA do not account for potential effects of economic shocks arising from the coronavirus pandemic.

Years of analysis: The years of analysis are 2021, to represent the first-year facilities are affected by this action, through 2030, to represent impacts of the rule over a longer period, as discussed in Section 2.2.2. While it would be desirable to analyze impacts beyond 2030 in this RIA, the EPA has chosen not to do this largely because of the limited information available on the turnover rate of emissions sources and controls. Extending the analysis beyond 2030 would introduce substantial and increasing uncertainties in the projected impacts of the final Policy Review.

State regulations in the baselines for this analysis: As discussed in Section 2.1.1, with the information currently available, we are unable to determine where newly affected sources in the transmission and storage segment are expected to locate. Though there may be states with similar requirements to those of the oil and natural gas NSPS for the transmission and storage segment, we are unable to account for such situations in this analysis. Applicable facilities in these states with similar requirements will still be expected to follow state regulations. This analysis likely overestimates the compliance cost reduction from sources in transmission and storage because it includes estimates of incrementally affected facilities that would have similar state-level requirements under the baseline that will continue to apply to these facilities despite this rule.

Wellhead natural gas prices used to estimate forgone revenues from natural gas recovery: The compliance cost reductions estimates presented in this RIA include the forgone revenue associated with the decrease in natural gas recovery resulting from the decrease in emissions reductions. As a result, the national compliance cost reductions depend on the price of natural gas. As explained in Section 2.2.5, natural gas prices used in this analysis are from the projection of the Henry Hub price in the 2020 AEO. To the extent actual natural gas prices diverge from the AEO projections, the actual impacts will diverge from our estimates.

Monetized forgone methane-related climate benefits: The EPA considered the uncertainty associated with the social cost of methane (SC-CH_4) estimates, which were used to calculate the forgone domestic social benefits of the increase in methane emissions expected as a result of this action. The potential impacts of some uncertainties are accounted for in the analysis or discussed quantitatively, while other areas of uncertainty have not yet been quantified in a way that can be modeled. Section 2.3.3 and Appendix B provide detailed discussions of the ways in which the modeling underlying the development of the SC-CH_4 estimates used in this analysis addresses quantified sources of uncertainty and presents a sensitivity analysis to show consideration of the uncertainty surrounding the choice of discount rate over long time horizons.

Non-monetized forgone benefits: Several categories of forgone health, welfare, and climate benefits are not quantified in this RIA. These unquantified forgone benefits, in addition to the forgone benefits from increased emissions of methane, VOCs and HAP, are described in detail in Section 2.3.

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3 REGULATORY IMPACT ANALYSIS FOR THE OIL AND NATURAL GAS SECTOR: THE EMISSION STANDARDS FOR NEW, RECONSTRUCTED, AND MODIFIED SOURCES RECONSIDERATION

3.1 Introduction

This chapter presents the RIA for the final technical reconsideration of certain aspects of the Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources published in the Federal Register on June 3, 2016 ("2016 NSPS OOOOa"), referred to as the "Technical Reconsideration" in this chapter and document as a whole. In the 2016 NSPS OOOOa, new source performance standards (NSPS) were established to reduce greenhouse gas emissions and volatile organic compound (VOC) emissions from the oil and natural gas sector. The emission sources covered in the 2016 rule include hydraulically fractured oil and natural gas well completions, centrifugal compressors, reciprocating compressors, pneumatic controllers, storage vessels, equipment leaks at natural gas processing plants, sweetening units, pneumatic pumps, and fugitive emissions from well sites and compressor stations. In the action evaluated in this chapter, the EPA granted reconsideration of three aspects of the 2016 rule: fugitive emissions monitoring requirements, well site pneumatic pump standards, and requirements for certification of closed vent system design and capacity by a professional engineer. In addition, the EPA clarified definitions and reconsidered several issues to streamline implementation and improve cost-effectiveness of compliance.

In this chapter, we focus on the finalized changes to NSPS OOOOa that result in quantifiable compliance cost or emissions changes compared to a baseline that includes the Policy Review.[58] As described in Chapter 2 of this document, the Policy Review rescinds the requirements of the 2012 NSPS OOOO and the 2016 NSPS OOOOa for oil and natural gas sources in the transmission and storage segment. The Policy Review also rescinds the methane standards for sources in the production and processing segments, while leaving VOC requirements in place for production and processing sources. As a result, the RIA for the Technical Reconsideration

[58] The Technical Reconsideration rule was proposed (October 15, 2018) before the Policy Review was proposed (September 24, 2019). Due to the sequencing of the proposals, the RIA for the proposal of the Technical Reconsideration estimated impacts relative to a baseline that did not include consideration of elements of the later Policy Review proposal.

presented in this Chapter does not evaluate regulatory impacts to previously NSPS-affected sources in transmission and storage. Sequencing the two actions in this way—with the conclusions of the Policy Review in the baseline for the Technical Reconsideration—is consistent with the sequencing applied in the preamble and amended regulatory text for the two final actions.

The provisions analyzed in this chapter are related to fugitive emissions monitoring and professional engineer certification requirements. We do not analyze all finalized changes to NSPS OOOOa that are discussed in the preamble for the Technical Reconsideration because we either do not have the data to do so or because we have concluded that certain provisions are unlikely to result in measurable cost reductions or changes in emissions. Section 3.2.1 provides a basic description of the additional reconsidered provisions that are not quantified in the RIA. For additional details on these provisions, see the preamble to the Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Reconsideration, found in the docket.[59]

The 2016 NSPS OOOOa required all NSPS-affected well sites to perform semiannual monitoring and all NSPS-affected compressor stations to perform quarterly monitoring. On March 1, 2018, the EPA finalized a package containing amendments to the 2016 NSPS OOOOa (hereon, "Amendments package") to address immediate concerns regarding implementation issues related to the reliability of emissions monitoring equipment during extended periods of extreme cold temperatures on the Alaska North Slope.[60] The Amendments package reduced monitoring frequency at NSPS-affected well sites on the Alaska North Slope from semiannual to annual. In this final action, the EPA is reducing the required monitoring frequency at NSPS-affected compressor stations on the Alaska North Slope from quarterly to annual. We are unable to quantify the emissions impacts or cost reductions associated with this change for compressor stations on the Alaska North Slope due to a lack of data.[61]

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[59] Found on http://www.regulations.gov under Docket ID No. EPA-HQ-OAR-2017-0483.
[60] 83 FR 10628.
[61] The Amendments package did not change the fugitive emissions requirements for compressor stations located on the Alaska North Slope because there were no NSPS-affected compressor stations at the time, and therefore there was no immediate compliance issue to address (see 83 FR 10635). In this final action, EPA is aligning the fugitive emissions requirements for compressor stations with the changes made in the 2018 Amendments package for well sites on the Alaska North Slope. Nevertheless, there is still no indication that there are any

In the 2016 NSPS OOOOa, the EPA finalized a requirement for closed vent systems (CVS) for NSPS-affected storage vessels, pneumatic pumps, reciprocating compressors, and centrifugal compressors to be certified by a professional engineer. In addition, the EPA finalized a requirement for well site sources claiming that feasibility issues constrain their ability to route pneumatic pump emissions to a control device. The 2016 NSPS required such sources to obtain a certification of technical infeasibility from a "qualified professional engineer." The compliance costs for these engineering certifications were not considered in the rulemaking for the 2016 NSPS OOOOa. For this final action, the EPA estimates and includes those compliance costs in the updated baseline and assesses the impact of a change being finalized which allows technical infeasibility certifications and CVS certifications to be performed by either in-house engineers or professional engineers.

This analysis projects the impacts of the Technical Reconsideration for the years 2021 through 2030. All monetized impacts are presented in 2016 dollars. This analysis also includes a presentation of the impacts in a present value (PV) framework. All sources affected by the 2016 NSPS OOOOa are referred to as "NSPS-affected sources." The subset of sources whose requirements are altered by the Technical Reconsideration of the 2016 NSPS OOOOa are referred to as "reconsideration-impacted sources." Note that the universe of reconsideration-impacted sources varies across the regulatory options considered in this RIA.

3.1.1 Summary of Changes Since the Final 2016 NSPS RIA

This RIA applied several updates to the data, assumptions, source counts, projections, and baseline state and local regulations since finalizing the 2016 NSPS OOOOa. The projected compliance cost and emission impacts of the three options analyzed in this RIA are compared to an updated baseline that includes the Policy Review. These updates include the incorporation of information received during the public comment period for the proposal of this Technical Reconsideration.[62] Other than the updates noted below, the baseline used in this RIA was determined using the same assumptions and methods as the 2016 NSPS RIA. The updated baseline represents the EPA's best assessment of the current and future state of the industry and

compressor stations on the Alaska North Slope currently subject to the 2016 NSPS OOOOa fugitive emissions requirements, nor is EPA able to project potential new or modified compressor stations in specific locations.

[62] See preamble and response to comments document, which are available in the docket.

economy. The changes in the following list were included in the RIA for the proposal of this Technical Reconsideration action. We also indicate the updates in this final RIA made since the proposal RIA.

- **Annual Energy Outlook:** In the 2016 NSPS OOOOa, we used the 2015 Annual Energy Outlook (AEO). For the proposal of this Technical Reconsideration, we used the AEO2018. We use the most recent AEO in this RIA, the AEO2020, published in January 2020.[63] The drilling activity projections in the AEO2020 are used to project the number of NSPS-affected sources over time, and the AEO2020 projections for natural gas prices are used to estimate the value of product recovery in this RIA.
- **Source Projections:** Since the promulgation of the 2016 NSPS OOOOa, the U.S. Greenhouse Gas Inventory (GHGI) has been updated.[64] The data from the updated GHGI was used in the projection of NSPS-affected sources over time. In addition, for a few sources, we relied on information from 2016 NSPS OOOOa compliance reports to inform our projections.
- **DrillingInfo:** This RIA uses a more recent version of the DrillingInfo data, which is used to characterize oil and natural gas wells and completion activity in the base year, than was used for the 2016 NSPS OOOOa.[65] The version used for this analysis was pulled in January 2017 and uses 2014 as the base year. The base year was 2012 in the 2016 NSPS OOOOa RIA.
- **State and Local Regulations:** Since the promulgation of the 2016 NSPS OOOOa, state and local authorities have issued requirements affecting the oil and natural gas sector, with the most significant changes resulting from new regulations in California and general permitting requirements in Pennsylvania. In this analysis, we account for updated requirements in California, Colorado, Ohio, Pennsylvania, Texas,[66] and Utah. Updated requirements for some facilities in these states are expected to result in similar emissions reductions to those expected from the 2016 NSPS OOOOa and this reconsideration, though the programs in these states function differently than the 2016 NSPS OOOOa and this reconsideration. In the RIA for the 2016 NSPS, it was determined that the rule would not achieve additional emissions reductions in Wyoming relative to those that would already be achieved by the state program. The requirements in Wyoming were re-examined and are no longer considered to function in a way that reduces emissions by as

[63] AEO2020 can be found at https://www.eia.gov/outlooks/aeo/.

[64] The updated GHGI data used is from the April 2018 release. For information on the inventory, visit https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks.

[65] DrillingInfo is a private company that provides information and analysis to the energy sector. More information is available at http://info.drillinginfo.com.

[66] EPA proposed that certain fugitive emissions monitoring-related permits in Texas would be considered equivalent, but not all types of permits. At proposal, EPA did not have quantitative information on the share of Texas permits that, as proposed, would be considered equivalent. Information received during the public comment period for this action provides EPA with a basis to perform quantitative analysis for Texas facilities in this RIA. EPA also received additional information of the share of facilities in Ohio that whose fugitive emissions monitoring-related emissions requirements would be considered equivalent to NSPS OOOOa requirements.

much as the NSPS requirements, as Wyoming has facility-specific permit requirements, so requirements are not uniform across the entire state.[67]

- **Fugitive Emissions Monitoring Requirements**: Since the promulgation of the 2016 NSPS OOOOa, the EPA finalized a package amending fugitive emissions monitoring requirements for NSPS-affected oil and natural gas well sites on the Alaska North Slope. The updated baseline used in this RIA accounts for the impacts of the Amendments package, which reduced the frequency of fugitive emissions monitoring requirements for NSPS-affected well sites on the Alaska North Slope from semiannual to annual.

- **Professional Engineer Certification**: The 2016 NSPS OOOOa requires that claims of technical infeasibility for pneumatic pump control requirements and requires the design and operation of CVS be certified by a professional engineer. The cost of this certification requirement was not quantified in the 2016 NSPS RIA. In this analysis, the baseline includes the cost of complying with the professional engineer certification requirement.

- **Social Cost of Methane:** In the 2016 NSPS OOOOa, the EPA used an estimate of the global social cost of methane to monetize the climate related benefits associated with reductions in methane emissions. Since the promulgation of the 2016 NSPS OOOOa, Executive Order (E.O.) 13783 has been signed, which directs agencies to ensure that estimates of the social cost of greenhouse gases used in economic analyses are consistent with the guidance contained in the Office of Management and Budget (OMB) Circular A-4, "including with respect to the consideration of domestic versus international impacts and the consideration of appropriate discount rates" (E.O. 13783, Section 5(c)). Thus, for this reconsideration, we use an interim estimate of the domestic social cost of methane to quantify the forgone climate benefits resulting from the increase in methane emissions due to this final action.

- **Model Plants:** The EPA uses model plants to estimate emissions from well sites and emission reductions due to the fugitive emissions monitoring requirements. Some assumptions used for the model plants have been updated since the 2016 NSPS. The update includes the addition of fugitive emissions components, namely storage vessels. By adding storage vessels to the model plant, the estimates of baseline emissions from well sites are larger, and the reductions attributed to monitoring and repair requirements are larger than those based on the model plants used in the 2016 NSPS RIA.[68]

- **Other**: In the 2016 NSPS OOOOa, impacts were presented in 2012 dollars. In this RIA and the RIA for the proposal of the Technical Reconsideration, impacts are presented in

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[67] For information on additional states that were examined and why they are not considered equivalent, see the TSD and the memo "Equivalency of State Fugitive Emissions Programs for Well Sites and Compressor Stations to Standards at 40 CFR Part 60, Subpart OOOOa", both of which are available in the docket.

[68] For more information on the model plants, see the TSD. The number and type of fugitive emissions components located at well sites and compressor stations can consist of a large variety of combinations of process equipment and other components. Model plants were developed be varying the number and types of components and other equipment based on data available to the EPA, including the DrillingInfo database, the 1996 EPA/GRI Study, the EPA's GHG Inventory for 2017, the EPA's GHG Mandatory Reporting Rule (40 CFR part 98, subpart W), and information received in public comments. The number and types of components are associated with emissions factors to estimate uncontrolled emissions for the model plants.

2016 dollars.[69] In the 2016 NSPS RIA, we presented regulatory impacts for the snapshot years of 2020 and 2025. For this analysis, we estimate cost reductions and emissions impacts resulting from changes in compliance activities projected to occur in each year from 2021 through 2030 due to this final action.[70] Impacts are discounted to 2020. We present the PV and equivalent annualized value (EAV) of impacts from this Technical Reconsideration over the analysis period.[71]

3.1.1.1 Updated Baseline for the Technical Reconsideration

Table 3-1 below shows the projected number of NSPS-affected sources, methane emission reductions, VOC emission reductions, and the total annualized compliance costs, including the value of product recovery, in 2021 and 2025 for the 2016 NSPS OOOOa fugitive emissions monitoring requirements for sources in the production and processing segment as estimated in the 2016 NSPS RIA, and under the updated baseline used in this RIA (elsewhere in this document simply referred to as “the baseline”). We compare the different baseline projections for years 2021 and 2025 because those are the earliest and latest years in which the 2016 NSPS RIA analysis horizon and the Technical Reconsideration analysis horizon overlap. We exclude the impacts of other provisions in the 2016 NSPS OOOOa in order to highlight the differences in the estimated impacts of the fugitive emissions monitoring requirements between the 2016 RIA baseline and the updated baseline used in this final RIA. Also, to be consistent with the presentation of impacts in the 2016 RIA, the updated baseline estimates in Table 3-1 exclude the compliance costs associated with the professional engineer certification requirement.

[69] Costs were adjusted to 2016 dollars using the seasonally adjusted annual Gross Domestic Product: Implicit Price Deflator released by the Federal Reserve on January 26, 2018.

[70] In this analysis, the DrillingInfo base year was updated from 2012 to 2014. Therefore, the source projection estimates are based on reconsideration-impacted facilities established starting in 2014 and continuing through 2030.

[71] The Technical Reconsideration proposal RIA discounted the PV of impacts to 2016. In this RIA, we discount the PV to 2020 to improve interpretability.

Table 3-1 Estimated Compliance Costs and Emission Reductions of the 2016 NSPS OOOOa Fugitive Emissions Monitoring Requirements in the Production and Processing Segment: 2016 NSPS RIA and Updated Baseline Comparison

	2016 NSPS RIA		Updated Baseline	
	2021	2025	2021	2025
Counts of NSPS-Affected Fugitive Emissions Monitoring Sources[1]	130,000	210,000	62,000	110,000
Methane Emission Reductions (short tons)	230,000	370,000	100,000	170,000
VOC Emission Reductions (tons)	64,000	100,000	29,000	47,000
Total Annualized Compliance Cost, without Product Recovery (7%, millions 2016$)[2]	$330	$530	$150	$260
Total Annualized Compliance Cost, with Product Recovery (7%, millions 2016$)[2]	$280	$440	$140	$230

[1] The difference in the number of sources is due to updated source count projections based on the GHGI and compliance reports.
[2] Excluding compliance cost of professional engineer certification, as well as other provisions in the 2016 NSPS OOOOa unrelated to fugitive emissions monitoring requirements.

The difference in the estimates stems from a couple of factors. First, the updated baseline includes the Amendments package change to the frequency of fugitive emissions monitoring requirements for well sites on the Alaska North Slope, as explained above. Second, the assumptions used for the updated baseline have been updated from the 2016 NSPS RIA as explained above (*e.g.*, the facility-count and natural gas price projections, state and local regulations, and model plant characteristics). Moreover, the costs associated with the 2016 NSPS OOOOa in Table 3-1 do not match the compliance cost estimates for the fugitive emissions monitoring requirements presented in the 2016 NSPS RIA. This is because costs in the 2016 NSPS RIA were in 2012 dollars, and they have been updated to 2016 dollars in this RIA.

3.1.2 Summary of Changes Based on Information Received During Comment Period

The following list summarizes the changes in this RIA made based on information received during the public comment period for the proposed Technical Reconsideration:

- **Extended final year of analysis from 2025 to 2030:** The RIA for the proposal evaluated impacts from 2019 to 2025. In response to comments, we extend the analysis period in this RIA to 2030. Since this action is being finalized in 2020, we present impacts from 2021 to 2030, as 2021 is expected to be the first year the rule is implemented.
- **Projection of wells sites transitioning to low production status:** In the final rule, the EPA is allowing an option for well site owners or operators to determine when the total production for the well site falls to 15 barrels of oil equivalent (boe) per day or lower, calculated as a rolling 12-month average. If the well site was previously subject to the

fugitive emissions monitoring requirements and total well site production falls to or below this threshold, then the owner or operator has the option to stop monitoring and instead maintain total well site production below this threshold. In order to estimate the impacts of this provision, we model the transition of a well site to low production using historical well information. More detail on this is presented in Section 3.2.3.

- **Streamlined recordkeeping and reporting requirements:** This final rule amends recordkeeping and reporting requirements for well completions and fugitive emissions for well sites and compressor stations. For well completions, the number of data fields required to be recorded and reported have been reduced. For fugitive emissions, this rule includes several changes intended to streamline recordkeeping and reporting, including replacing the sitemap and observation path requirement with other procedures that ensure that all components are monitored during each survey.[72] Based on public comments received, we revised our estimates of recordkeeping and reporting costs associated with the fugitive emissions requirements, as well as our estimates of the cost burden associated with developing and updating the sitemap and observation path.

  We do not expect the changes to recordkeeping and reporting requirements to affect emissions. For some line items, requirements were determined to be redundant. For the site map and observation path, flexibility is now available for sources to use other methods of compliance with the primary objective, which is that all components are monitored during a survey. Details on the costs of recordkeeping and reporting requirements for fugitive emissions can be found in Section V.B of the preamble.

- **Alternative fugitive emissions standards for sites located in certain states:** The final rule includes alternative fugitive emissions standards for well sites and compressor stations located in specific states based on the EPA's review of those state programs and our conclusion that they are equivalent to the fugitive emissions requirements in NSPS OOOOa. These states are California, Colorado, Ohio, Pennsylvania, Texas, and Utah.[73] Alternative fugitive emissions standards may be adopted in lieu of the NSPS fugitive emissions monitoring and repair requirements at individual well sites or compressor stations that are regulated under these state programs. A well site or compressor station regulated under an alternative fugitive emissions standards could comply with state standards for monitoring, repair, recordkeeping, and reporting in lieu of the requirements for those activities in the NSPS provided they still follow the monitoring plan requirements and monitor all fugitive emissions components as defined in the NSPS.

[72] See Section IV.I of the preamble for a comprehensive summary of changes to recordkeeping and reporting requirements.

[73] We determined that all well sites and compressor stations in four states (California, Colorado, Pennsylvania, and Utah) were subject to state requirements at least as effective as the NSPS OOOOa at reducing emissions. As noted above, at proposal, the EPA did not have quantitative information on the share of Texas permits that, as proposed, would be considered equivalent. Information received during the public comment period for this action provided EPA with a basis to perform quantitative analysis for Texas facilities in this RIA. EPA also received additional information of the share of facilities in Ohio whose fugitive emissions monitoring requirements would be considered equivalent to NSPS OOOOa requirements. Based on analysis received in public comment, we assume that 5.5 percent of sites in Texas and 80 percent of sites in Ohio would qualify for an alternative fugitive emissions standard. All sources in the remaining states listed are assumed to need to comply with the fugitive emissions monitoring requirements in NSPS OOOOa.

The compliance cost reductions associated with this flexibility for the states above were not quantified in the RIA for the proposal of this reconsideration. Based on public comments and a review of the final provisions in this rule, we estimated compliance cost reductions for otherwise NSPS-affected sources in the states listed above assuming they will have reduced annual costs associated with reporting and recordkeeping. The cost reductions associated with the alternative fugitive emissions standards flexibility are not applied retroactively since we assume that the recordkeeping and reporting costs associated with NSPS OOOOa compliance to date have already been incurred.

- **Engineering certifications for closed vent systems:** The final rule includes changes from the proposal in the assumptions for the costs and number of certifications required for closed vent systems. Based on information received in public comments, we revised the labor costs assumed for both professional and in-house engineers upward. Commenters noted that the EPA had underestimated the time required to certify closed vent systems and the had not accounted for the costs associated with obtaining expertise from a third-party service with region and location-specific knowledge. In addition, based on our review of compliance reports, the projected number of facilities requiring certifications decreased compared to the RIA for the proposal.

3.1.3 Regulatory Options

The universe of reconsideration-impacted sources includes sources considered new or modified starting in 2021, as well as sources that were affected by the 2016 NSPS OOOOa before 2021 which are expected to change compliance activity due to this Technical Reconsideration. As we assume that engineer certifications only happen once, the only sources affected by the final changes to the certification requirements are those that are affected starting in 2021, the year this rule is expected to take effect.

We also examine two more stringent alternative regulatory options that were not finalized. The universe of reconsideration-impacted sources may change under the different options. Table 3-2 shows the emissions points and regulatory requirements for affected sources under the 2016 NSPS OOOOa, the updated baseline, and the three options analyzed in this RIA.

The 2016 NSPS OOOOa requires semiannual (twice per year) fugitive emissions surveys and repairs to be performed at NSPS-affected well sites, and quarterly surveys at gathering and boosting compressor stations.[74] Further, as previously stated, the 2016 NSPS OOOOa requires

[74] The 2016 NSPS OOOOa requires quarterly monitoring at all NSPS-affected compressor stations (*i.e.,* gathering and boosting, transmission, and storage compressor stations). For purposes of this analysis, the baseline used reflects the removal of requirements for transmission and storage compressor stations, therefore, this analysis is limited to gathering and boosting compressor stations.

professional engineer certifications of closed vent systems and for any claim that it is technically infeasible to control pneumatic pump emissions.

Table 3-2 Emissions Sources and Controls Evaluated by Regulatory Alternative

Emissions Point	2016 NSPS OOOOa	Updated Baseline	Option 1	Option 2	Option 3 (Finalized)
Fugitive Emissions Monitoring					
Natural Gas and Oil Well Sites	Semiannual	Semiannual	Semiannual-streamlined	Semiannual-streamlined	Semiannual - streamlined
Natural Gas and Oil Well Sites – Low Production	Semiannual	Semiannual	Semiannual-streamlined	No Monitoring	No Monitoring
Compressor Stations in Gathering and Boosting	Quarterly	Quarterly	Quarterly-streamlined	Quarterly-streamlined	Semiannual-streamlined
The Alaska North Slope					
Natural Gas and Oil Well Sites (Alaska North Slope)	Semiannual	Annual	Annual-streamlined	Annual-streamlined	Annual-streamlined
Natural Gas and Oil Well Sites (Alaska North Slope) – Low Production	Semiannual	Annual	Annual-streamlined	No Monitoring	No Monitoring
Compressor Stations in Gathering and Boosting (Alaska North Slope)[1]	Quarterly	Quarterly	Annual-streamlined	Annual-streamlined	Annual-streamlined
Alternative Means of Emission Limitation	None	None	Operations in Six States	Operations in Six States	Operations in Six States
Certifications					
Closed Vent Systems on Pneumatic Pumps, Reciprocating Compressors, Centrifugal Compressors, and Storage Vessels; and Pneumatic Pump Technical Infeasibility	Professional Engineer	Professional Engineer	In-House Engineer	In-House Engineer	In-House Engineer

[1] We do not currently have data to estimate the effects of this final action for gathering and boosting stations on the Alaska North Slope. All other provisions presented in this table are analyzed in this RIA.

The baseline reflects finalized NSPS OOOOa requirements as of 2020, including that fugitive emissions survey and repair programs are now required to be performed annually at NSPS-affected well sites in the Alaska North Slope due to the Amendments package, semiannually at all other NSPS-affected well sites, and quarterly at gathering and boosting stations. Professional engineer certifications are required for closed vent systems and pneumatic pumps in the baseline.

Option 1 (not selected for promulgation): Option 1 is the most stringent alternative assessed in this RIA. Option 1 retains annual monitoring and repair frequency for affected well sites on the

Alaska North Slope and reduces the monitoring frequency for affected compressor stations on the Alaska North Slope. The semiannual survey and repair requirements are retained for all other NSPS-affected well sites. Quarterly monitoring is retained at all other NSPS-affected gathering and boosting compressor stations. Under this option, recording and recordkeeping requirements at all NSPS-affected sources subject to fugitive emissions monitoring requirements are streamlined. The certification requirement for closed vent systems and pneumatic pump technical infeasibility is changed to allow companies the option of using an in-house engineer as opposed to a professional engineer.[75] Also, fugitive emissions monitoring programs in six states are certified as alternatives, which reduces reporting and recordkeeping burden but does not affect emissions. In aggregate, unselected Option 1 would likely reduce regulatory compliance costs while having no quantifiable impacts on the emissions reductions projected for the 2016 rule.[76]

Option 2 (not selected for promulgation): This option is less stringent than Option 1. Under the option, monitoring frequencies are semiannual for well sites, excluding well sites with total combined oil and natural gas production at or below 15 boe per day (*i.e.*, "low production well sites"), quarterly for gathering and boosting compressor stations, and annual for well sites and compressor stations located on the Alaska North Slope. The option rule excludes fugitive emissions monitoring for low production well sites. Instead, low production well sites are required to maintain total well site production at or below 15 boe per day and maintain records. Additionally, the option allows fugitive monitoring to stop when all major production and processing equipment is removed from a well site such that it becomes a wellhead-only well site; however, the EPA does not have information on the potential number of sites this provision applies to and, as a result, cannot estimate the associated regulatory impacts. Reporting and recordkeeping requirements at all NSPS-affected sources subject to fugitive emissions monitoring requirements are streamlined. The certification requirement for closed vent systems and pneumatic pump technical infeasibility is changed to allow companies the option of using an

[75] Emissions should not be affected by this change in certification requirements to the extent that the use of an in-house engineer does not result in any change in the closed vent systems being certified or the number of technical infeasibility determinations for pneumatic pumps. We are not able to estimate the potential, if any, for such technical changes from allowing in-house engineer certifications.
[76] Reducing monitoring frequency for affected compressor stations on the Alaska North Slope results in reduced regulatory burden related to the reduced monitoring frequency. However, as EPA does not currently have the data to estimate the effects of the final action pertaining to compressor stations on the Alaska North Slope, this RIA does not present quantitative estimates of reduced regulatory compliance costs or potential emissions increases associated with these changes for compressor stations on the Alaska North Slope.

in-house engineer as opposed to a professional engineer. Also, fugitive emissions monitoring programs in six states are certified as alternatives, reducing reporting and recordkeeping burden for some sources.

Option 3 (finalized): Option 3 the least stringent option analyzed in this RIA. The finalized Option 3 is the same as Option 2 except for the monitoring frequency at gathering and boosting compressor stations is reduced to semiannual. This results in higher cost reductions relative to the baseline and increased forgone emissions reductions.

In addition to the requirements listed in Table 3-2, the 2016 NSPS OOOOa contains well completion requirements for a subset of newly completed oil wells that are hydraulically fractured or refractured. The 2016 NSPS OOOOa also requires reductions from centrifugal compressors, reciprocating compressors, pneumatic controllers, storage vessels, equipment leaks at natural gas processing plants, and sweetening units throughout the crude oil and natural gas production source category. These requirements are not analyzed in this RIA because they are not affected by this Technical Reconsideration, and thus the compliance cost and emissions impacts from these 2016 requirements are not altered due to this reconsideration.

3.1.4 Technical Reconsideration: Summary of Key Results

A summary of the key results is shown below. All estimates are in 2016 dollars. Also, all compliance costs, emissions changes, and benefits are estimated relative to a baseline that includes the Policy Review. We estimate that the Technical Reconsideration will potentially affect up to approximately 537 firms.[77]

- **Emissions Analysis:** The Technical Reconsideration is projected to result in forgone methane emission reductions of 19,000 short tons in 2021 and 75,000 short tons in 2030 and a total of 450,000 short tons from 2021 to 2030. Forgone VOC emission reductions are projected to be 5,200 short tons in 2021 and 21,000 short tons in 2030 and a total of 120,000 short tons from 2021 to 2030. Forgone HAP emissions are projected to be 200

[77] We estimate the number of firms potentially affected firms using information in the Information Collection Request (ICR) Supporting Statement associated with this rulemaking. Before promulgating the Policy Review, the EPA estimates that up to 575 firms would be subject to NSPS OOOOa during the 3-year period covered by the ICR (Table 1d of the Supporting Statement). We then estimate that up to 537 respondents per year will be subject to NSPS OOOOa during the 3-year period covered by the ICR (Section 6(d) of the Supporting Statement). The estimate of 537 firms potentially affected by the technical reconsideration should be viewed as an upper bound as some firms affected by NSPS OOOOa may be subject to requirements that are unchanged by this action.

short tons in 2021 and 790 short tons in 2030 and a total of 4,700 short tons from 2021 to 2030.

- **Benefits Analysis:** The Technical Reconsideration is projected to result in forgone climate, health, and welfare benefits. The PV of the domestic forgone climate benefits, using an interim estimate of the domestic social cost of methane (SC-CH_4) and discounting at a 7 percent rate is $19 million from 2021 to 2030. The EAV is estimated to be $2.5 million per year. Using the interim SC-CH_4 estimate based on the 3 percent rate, the PV of forgone domestic climate benefits is estimated to be $71 million; the EAV is estimated to be $8.1 million per year. The EPA expects that forgone VOC emission reductions will negatively affect air quality and likely affect health and welfare adversely due to impacts on ozone, $PM_{2.5}$, and HAP, but we are unable to quantify these effects at this time. This omission does not imply that these forgone benefits do not exist.
- **Compliance Cost Analysis:** The Technical Reconsideration is projected to result in compliance cost reductions. The PV of the compliance cost reductions associated with this final rule over the 2021 to 2030 period is estimated to be $800 million (2016$) using a 7 percent discount rate and $1 billion using a 3 percent discount rate. The EAV of these cost reductions is estimated to be $110 million per year using a 7 percent discount rate and $110 million per year using a 3 percent discount rate. These estimates do not include the forgone producer revenues associated with a decrease in the recovery of saleable natural gas due to this final action, as some of the compliance actions required in the baseline would likely have captured saleable product that would have otherwise been emitted. Using the 2020 Annual Energy Outlook (AEO) projection of natural gas prices to estimate the value of the change in the recovered gas at the wellhead expected to result from this action, the EPA estimated a PV of regulatory compliance cost reductions of the final rule over the 2021 to 2030 period of $750 million using a 7 percent discount rate and $950 million using a 3 percent discount rate. The corresponding estimates of the EAV of cost reductions after accounting for forgone product recovery revenues are $100 million per year using a 7 percent discount rate and $110 million per year using a 3 percent discount rate.
- **Energy Markets Impacts Analysis:** The 2016 NSPS RIA estimated small (less than 1 percent) impacts on energy production and markets. The EPA expects that the deregulatory Technical Reconsideration will reduce energy market impacts of the NSPS.
- **Distributional Impacts:** The cost reductions and any forgone benefits likely to arise from the Technical Reconsideration are not expected to be distributed uniformly across the population, and may not accrue equally to the same individuals, firms, or communities impacted by the 2016 rule. The EPA did not conduct a quantitative assessment of the distributional impacts of the final Technical Reconsideration, but we provide a qualitative discussion of the distributional aspects of the cost reductions and the forgone health benefits.
- **Small Entity Impacts Analysis:** The EPA expects this final deregulatory action to reduce the small entity impacts estimated in the RIA for the 2016 NSPS OOOOa. We therefore find that this final action will relieve regulatory burden for small entities affected by this final action and thus will not have a Significant Impact on a Substantial Number of Small Entities (SISNOSE).
- **Employment Impacts Analysis:** The EPA expects reductions in labor associated with compliance-related activities due to this action. The EPA estimated the labor impacts due

to the forgone installation, operation, and maintenance of control equipment and control activities, as well as the reductions in labor associated with reduced reporting and recordkeeping requirements. The EPA estimated one-time and continual, annual labor requirements by estimating hours of labor required for compliance and converting this to full-time equivalents (FTEs) by dividing by 2,080 (40 hours per week multiplied by 52 weeks). The reduction in one-time labor needed to comply with the NSPS due to this action is estimated to be about 42 FTEs in 2021 and 91 FTEs in 2030. The reduction in annual labor needed to comply with the NSPS due to this action is estimated at about 490 FTEs in 2021 and 1,300 FTEs in 2030. The EPA notes that this type of FTE-estimate cannot be used to identify the specific number of employees involved or whether new jobs are created for employees who potentially lose their jobs, versus displacing jobs from other sectors of the economy.

3.1.5 Organization of the Technical Reconsideration RIA

Section 3.2 describes the estimated compliance cost reductions and forgone emissions reductions from the Technical Reconsideration, including the PV of the projected cost reductions over the 2021 to 2030 period and the associated EAV. Section 3.3 describes the projected forgone benefits resulting from this rule, including the PV and EAV over the 2021 to 2030 period. Section 3.4 describes the economic impacts expected from this action. Section 3.5 compares the projected forgone benefits and compliance cost reductions of this action, including a summary of the net benefits.

3.2 Compliance Cost Reductions and Forgone Emissions Reductions

This section describes the emissions and compliance cost analysis for the final Technical Reconsideration of the 2016 NSPS OOOOa. Projected incremental changes in emissions and compliance costs resulting from this reconsideration are estimated relative to the baseline, which is representative of more up-to-date data and projections and current policy. The baseline also includes the impacts of the final Policy Review, discussed in Chapter 2. Updates to the data and analytic approach from the 2016 NSPS RIA are described in Section 3.1.1. A detailed discussion of the updates since the 2016 NSPS RIA to the methodology, data, and assumptions used to estimate the compliance cost impacts of this reconsideration can be found in the TSD.[78] The methodology, data, and assumptions that are not mentioned are the same as those in the 2016 NSPS RIA and can be found in the 2016 NSPS Final TSD for that action.[79]

[78] The TSD for this final reconsideration can be found in Docket ID No. EPA-HQ-OAR-2017-0483.
[79] Docket ID No. EPA-HQ-OAR-2010-0505-7631.

There are two main steps in the compliance cost analysis. First, representative facilities (also referred to as model plants) are established for each affected source category.[80] The characteristics of the facilities include equipment inventories, operating characteristics, and representative factors including baseline emissions and the compliance costs, emissions reductions, and product recovery resulting from each compliance measure. Second, we project the number of NSPS-affected facilities in each source category for each type of equipment, and then estimate the number of reconsideration-impacted sources. The change in emissions and compliance costs are calculated by multiplying representative factors from the first step by the number of reconsideration-impacted facilities estimated in the second step for each projection year. In addition to emissions reductions, some aspects of the regulatory options may result in natural gas recovery, which can then be combusted by the sources for production purposes or sold. The compliance cost impacts include the change in estimated revenue from product recovery, where applicable.

Throughout this section, we present the projected effects of the final Technical Reconsideration on compliance costs and emissions from 2021 through 2030, under the assumption that 2021 is the first year the reconsidered requirements will take effect. Comparing the 2016 NSPS RIA results to this analysis should be done with caution. The baseline of affected sources has been updated in this analysis, as explained in Section 3.1.1.1, and results in this RIA are presented in 2016 dollars, while the 2016 NSPS RIA results are in 2012 dollars.

3.2.1 Pollution Controls and Emissions Points Assessed

The RIA in this chapter estimates impacts associated with the reconsidered requirements for fugitive emissions monitoring and certifications of closed vent system design. In addition, the EPA changed requirements related to pneumatic pumps and oil well completions and provided additional technical corrections and clarifications; however, this RIA does not quantify any changes in emissions or costs resulting from these changes. This section provides a basic

[80] See Section 2 of the TSD accompanying this final action for more detail on how model plants were developed. As described in Section 2.3.1 of this TSD, model plants were developed to represent equipment and component counts at the different site types. These model plants allow for consideration of costs and emission reduction impacts. While actual sites may be larger than the models, focus was placed on small sites since that is where the impacts are most likely to be more burdensome. Where impacts are reasonable, we can be certain that they will also be reasonable for larger sites.

description of the emissions sources and control requirements affected by the Technical Reconsideration and indicates which aspects of the final reconsideration we quantify impacts for in this RIA. For more detailed information on the requirements that were reconsidered, see the preamble. For information on the emission sources and control measures evaluated for the 2016 NSPS OOOOa, see the 2016 NSPS RIA.

Fugitive Emissions Monitoring Requirements: Fugitive emissions occur when connection points on equipment are not fitted properly or when seals and gaskets start to deteriorate. Pressure, changes in pressure, or mechanical stresses can also cause components or equipment to leak. Potential sources of fugitive emissions include valves, connectors, pressure relief devices, open-ended lines, flanges, closed vent systems, and thief hatches or other openings on a controlled storage vessel. For purposes of this rulemaking, fugitive emissions points do not include devices that vent as part of normal operations. In the 2016 NSPS RIA, the EPA estimated compliance costs and emission reductions assuming the use of a leak monitoring program where optical gas imaging (OGI) leak detection was combined with leak correction. In addition, the 2016 RIA considered the following alternative frequencies for fugitive emissions survey requirements: annual, semiannual, and quarterly. This RIA estimates the impacts from reducing fugitive emissions monitoring frequency from the frequency required in the 2016 NSPS OOOOa for some NSPS-affected oil and natural gas facilities. The EPA is also making changes to allow several fugitive emissions monitoring state programs to be considered equivalent to NSPS OOOOa in terms of emissions reductions, which will lead to reductions in the NSPS reporting and recordkeeping burden for some sources regulated under some of the designated state programs.

Professional Engineer Certifications: Closed vent systems can be used to route emissions from various equipment at oil and natural gas facilities, including storage vessels, compressors, and pneumatic pumps, to control devices. Closed vent systems must be designed and tailored to individual facilities' equipment configuration and process factors, such as flow rates. For the 2016 NSPS OOOOa, the EPA required closed vent systems be certified by a professional engineer. In addition, the 2016 NSPS OOOOa requires that facilities citing compliance issues due to technical infeasibility in routing emissions from well site pneumatic pumps to an existing control device must have a professional engineer certify said technical infeasibility. The compliance cost impact of the professional engineer certification requirements was not evaluated in the 2016 NSPS RIA. For this analysis, the EPA evaluated the cost impacts of the certification requirements in the 2016 NSPS in order to determine the impact of the reconsidered provision that allows facilities to choose either a professional engineer or an in-house engineer to perform the required certification for technical infeasibility.

Additional Reconsideration Topics Not Quantified in this RIA: The preamble and regulatory text for this final Technical Reconsideration action contain several finalized provisions for which we do not quantify impacts in this RIA. These include, but are not limited to the following:

Pneumatic Pumps: The EPA is finalizing changes in the circumstances for which it may be infeasible to control emissions from well site pneumatic pumps by removing the distinctions between greenfield and non-greenfield sites. These changes are intended to better distinguish the circumstances where pneumatic pump controls may be infeasible. This provision is not expected to result in changes in emissions.

Well Completions: The EPA is finalizing changes and adding clarifications related to the location of separators during flowback operations, recordkeeping requirements for reduced emission completions, and the definition of flowback (*e.g.*, to exclude screenouts, coil tubing cleanouts, and plug drill out processes). Some of these changes could reduce compliance costs (*e.g.*, by decreasing recordkeeping burden) or result in higher emissions relative to the baseline, but the EPA does not have the necessary data and information to quantify these potential impacts.

Fugitive Emissions Monitoring: The EPA is finalizing changes to several definitions used in the fugitive emissions monitoring provisions in NSPS OOOOa, including the definitions for modification, third party equipment, and underground disposal wells. The EPA is also finalizing changes to the repair requirements for fugitive emissions components. Some changes may result in cost reductions (*e.g.*, the exemption of monitoring requirements for third-party equipment and disposal wells), and may result in increased emissions (*e.g.*, by exempting a small number of fugitive components downstream of the custody meter from monitoring requirements), but the EPA does not have the ability to quantify these potential changes due to unavailability of necessary information and data (*e.g.*, counts for the relevant equipment and components).

Gas Processing Plants: The EPA is finalizing an exemption of Leak Detection and Repair (LDAR) requirements for equipment at gas processing plants which is used in VOC service for less than 300 hours per year and only during emergencies, as backup, or during startup and shutdown. This exemption may reduce compliance costs related to monitoring such equipment. This reduces burden related to the scheduling of monitoring when the equipment is in VOC service, however, any potential leaks from the equipment would be addressed once it is no longer in VOC service and monitoring is reinstated. The EPA does not have the data on the use of VOC service equipment needed to quantify potential impacts on costs and emissions from this LDAR exemption, however, any potential impacts are expected to be small based on the EPA's current understanding of the use of this type of equipment at gas processing plants.

Storage Vessels: The EPA is amending applicability criteria for NSPS-affected storage vessels. The final reconsideration clarifies how VOC emissions potential should be calculated for individual storage vessels and establishes criteria for calculating VOC emissions potential specifically from individual storage vessels that are part of a controlled tank battery. For controlled tank battery storage vessels (*i.e.*, two or more storage vessels joined with piping and sharing vapors in their headspaces, with emissions routed through a closed vent system to a control device or process with a VOC emissions control efficiency of at least 95.0 percent) subject to a legally and practicably enforceable limit, VOC emissions may be determined as an average of emissions per individual storage vessel for the entire tank battery. When VOC emissions for an individual storage vessel are greater than 6 tons per year, the storage vessel is affected by the applicable NSPS requirements. If average VOC emissions per storage vessel in a controlled tank battery are greater than 6 tons per year, each of the battery's storage vessels meet the criteria for being regulated under NSPS OOOOa.

3.2.2 Source-level Compliance Cost Reductions and Emission Increases

This RIA quantifies the compliance cost and emissions impacts of the changes to requirements affecting fugitive emissions monitoring, technical infeasibility certifications, and closed vent systems in the finalized Technical Reconsideration. Volume 1 of the TSD contains the facility-level compliance costs and emission reductions from the reconsidered fugitive emission requirements for each model plant. For this reconsideration, the TSD and RIA rely on a larger set of model plants to analyze impacts on oil and natural gas well sites than was used for the 2016 NSPS OOOOa RIA. The 2016 analysis used three model plants representing oil, oil with associated gas, or natural gas well sites, while impacts in this analysis are estimated for six model plants: non-low production natural gas well sites, non-low production oil-only well sites, non-low production oil with associated gas well sites, low-production natural gas well sites, low-production oil-only well sites, and low-production oil with associated gas well sites.

The refinements to the model plants used in this RIA are intended to better reflect the heterogeneity among well sites in the oil and natural gas sector. The production level distinction is important because the applicability of certain requirements in the final NSPS reconsideration depend on site production level. Additionally, the source-level impacts of parts of NSPS OOOOa are likely dependent on site production level (*e.g.*, compared to low-production natural gas well sites, non-low production natural gas well sites would be expected to experience greater forgone revenues associated with lower product recovery due to the monitoring frequency adjustments in this final rule).

The potential facility-level cost reductions and forgone emissions reductions estimated for the alternative regulatory options were calculated by subtracting the estimated NSPS-related compliance costs and emissions for the model plants under the alternative options for the Technical Reconsideration from the estimated NSPS-related compliance costs and emissions for the model plants under the baseline. For greater detail on the compliance cost estimates, including the estimates related to the individual aspects of NSPS OOOOa affected by this Technical Reconsideration, see Volume 1 of the TSD.

We have also re-evaluated our assumptions regarding equivalent state programs for fugitives that qualify as alternative standards. In the proposal analysis, if a well site was in a state determined to have fugitive emissions requirements for well sites effectively equivalent to those of NSPS OOOOa, even if not located in a state formally identified as equivalent, we assumed the proposed rule would reduce the NSPS fugitive emissions monitoring requirements. Thus, it was assumed the proposal would reduce the compliance costs associated with fugitive monitoring requirements in NSPS OOOOa for those sites, including the recordkeeping and reporting costs. In this analysis, we refined the assumptions used to quantify those costs to better reflect the impacts of state programs on fugitive monitoring and whether an alternative fugitive emissions standard could be applied in certain states, which should improve our estimates of the recordkeeping and recording burden reduced by this rule. In this RIA, we limit the cost reductions of the fugitive monitoring recordkeeping and reporting to certain well sites located in the states recognized in the rule as having fugitive emissions requirements that can qualify as an alternative fugitive emissions standard.

The operators with well sites that qualify under an alternative fugitive emissions standard instead of the NSPS OOOOa requirements for fugitive monitoring benefit from reduced recordkeeping and reporting burden. Specifically, for well sites under an alternative fugitive emissions standard, we assume operators save \$323 per year per site in reduced recordkeeping and data management costs (e.g., data QA/QC, tracking repairs, and database management fees as reported by commenters) and \$184 per year per site on annual reporting costs (equivalent to three labor hours spent preparing an annual report and storing/filing records), resulting in a total yearly cost reduction of \$507 per site. Because many firms operate in multiple states, and sources in only some states qualify under an alternative fugitive emissions standard, we continue to assume that operators with sites in non-alternative fugitive emissions standard states will continue to incur reporting and recordkeeping costs related to reading the rule, developing a fugitive emissions monitoring plan, and establishing and maintaining a database.

The costs of the professional engineer certification requirement were not included in the analysis of the 2016 rule. This analysis updates baseline cost estimates to include professional engineer certification costs, and the relative reduction in costs from the reconsidered provision which allows certifications to be done by in-house engineers. The cost of a professional engineer certification is estimated at \$4,500, and the cost of the same certification performed by an in-house engineer is estimated at \$2,950. Therefore, the cost reduced by this provision of the reconsideration is an estimated \$1,550 per certification.[81]

[81] At proposal, the EPA estimated the costs of these certifications to be \$358 for a certification by an in-house engineer and \$547 for a certification by a professional engineer. Commenters contended that EPA's cost estimates at proposal were underestimated because the costs did not account for the need to pay for the expertise of an external third-party with region and location-specific knowledge, the amount of time required to certify a CVS, or the other costs associated with the certification process. Based on these and other public comments, EPA revised the estimated cost of a certification by an in-house engineer to \$2,950 and to \$4,500 per certification performed by a professional engineer.

3.2.3 Projection of Affected Facilities

The second step in estimating national costs and emissions impacts of the final Technical Reconsideration is projecting the number of NSPS and reconsideration-impacted facilities. We first update the number of NSPS-affected facilities under the baseline. We then project the number of reconsideration-impacted facilities, which are facilities that would be expected to change their activities as a result of this reconsideration.

We analyze the effects of this final action on compliance costs and emissions compared to the baseline. The baseline includes the costs and emissions of the projected NSPS-affected facilities, after accounting for updated assumptions and data (Section 3.1.1 and 3.1.2). NSPS-affected facilities include facilities that are new or modified since the 2015 NSPS OOOOa proposal and were/are expected to change activities as a result of the 2016 NSPS OOOOa, starting from a baseline without the 2016 NSPS OOOOa. Over time, more facilities are newly established or modified in each year and, to the extent the facilities remain in operation in future years, the share of facilities in the sector and the total number of facilities which are subject to the 2016 NSPS OOOOa increase. This analysis assumes that all new equipment and facilities established from 2015 through 2029 are still in operation in 2030.

The reconsideration-impacted facilities are the subset of the NSPS-affected facilities that are expected to change activities as a result of this reconsideration. These facilities include sources that became affected facilities under the 2016 NSPS OOOOa prior to the effective date of this final action and assumed to still be in operation, as well as those that are projected to become newly affected sources in the future and are expected to change their compliance activities, relative to what they would have been otherwise, as a result of this final action. For the finalized option, these sources include fugitive emissions sources at well sites outside of the Alaska North Slope and compressor stations both outside of and on the Alaska North Slope.[82] For the change to certification requirements, only the projected newly affected sources that require a certification are considered reconsideration-affected in reference to the certification provision. Sources that

[82] We do not quantify any emissions or cost changes associated with new compressor stations on the Alaska North Slope.

have already completed professional engineer certifications are not counted as reconsideration-impacted sources since they will not need to obtain another certification.

The EPA projected the numbers of affected facilities using a combination of historical data from the GHGI, 2016 NSPS OOOOa compliance reports, and DrillingInfo, and projected activity levels taken from AEO2020. Appendix A contains more detailed information on the data sources and methods used to project reconsideration-impacted facilities. The EPA derived typical counts for new gathering and boosting stations by averaging the year-to-year changes in total national station counts in the GHGI.[83] Counts for storage vessels, pneumatic pumps, and reciprocating compressors, which feed into the assumed number of certifications, are based on 2016 NSPS OOOOa compliance reports.[84] New and modified well sites are based on the count of wells in 2014 from DrillingInfo, and projections and growth rates consistent with the drilling activity in the AEO. For this RIA, the projections have been updated from the AEO2015 projections used in the 2016 NSPS RIA to reflect the projection estimates in the AEO2020.[85] The AEO2020 projects that oil and natural gas well drilling will increase from about 29,000 wells in 2021 to about 32,000 wells in 2030. This projection is lower than the AEO2015 projection of about 43,000 wells in 2020 to about 52,000 wells in 2030 used in the 2016 NSPS RIA.

This RIA includes more detail than previous oil and natural gas NSPS analyses as it includes year-by-year results over the 2021 to 2030 analysis period and greater disaggregation of facilities

[83] The estimates for gathering and boosting stations do not include replacement or modification of existing sources, and so the impacts may be under-estimated due to the focus on new sources. Counts of newly constructed gathering and boosting stations are estimated based on averaging the year-to-year changes from 2004 to 2014 in the activity data in the GHGI. In years when the total count of equipment decreased, it was assumed there were no newly constructed units. In the GHGI, the EPA used an estimate of stations per quantity of marketed gas production (as estimated in Marchese et al., 2015) applied to the total quantity of marketed onshore gas production in a given year. For example, in 2016, the GHGI calculated 5,421 gathering stations in the U.S., based on one station per 53,066 scfd of marketed onshore gas production. More detailed information on how EPA derived these estimates are provided in the Appendix A.

[84] Consistent with the Policy Review analysis, we assume there are no centrifugal compressor affected facilities during our analysis horizon. We maintain our assumption from the 2016 NSPS RIA that 10% of reciprocating compressors are routed to closed vent systems and thus require certification. The total count of reciprocating compressors in the production and processing segment is the sum of: 1) the number of reciprocating compressors at gas processing plants according to 2016 NSPS OOOOa compliance reports; and 2) the number of reciprocating compressors at gathering and boosting stations, which is the number of reciprocating compressors at compressor stations according to 2016 NSPS OOOOa compliance reports less the number of reciprocating compressors at compressor stations in the transmission and storage segment as estimated from the 2004 to 2014 GHGI data.

[85] Note that the RIA associated with the proposal of this action used projections of well drilling and natural gas prices from AEO2018.

by vintage and production levels. While it would be preferable to analyze impacts beyond 2030, the EPA has chosen not to largely because of the limited information available to model long-term dynamics in practices and equipment in the oil and natural gas industry. The EPA has limited information on how practices, equipment, and emissions at new facilities evolve as they age and shut down. The current analysis assumes that newly established facilities remain in operation for the entire analysis period, and this assumption would be less realistic for a longer analysis period. In addition, in a dynamic industry like oil and natural gas, technological progress is likely to change control methods to a greater extent over a longer time horizon, creating more uncertainty about impacts of the NSPS.

The 2016 NSPS RIA assumed that the regulatory programs in the states of Colorado, Utah, Ohio, and Wyoming were expected to result in broadly similar overall emission reductions as the 2016 NSPS OOOOa requirements. For this action, the EPA reviewed state regulations and permitting requirements that require mitigation measures for many emission sources in the oil and natural gas sector. Detailed information is included in the TSD and in the memorandum *Equivalency of State Fugitive Emissions Programs for Well Sites and Compressor Stations to Proposed Standards at 40 CFR Part 60, Subpart OOOOa* ("State memo").[86] Resulting from this analysis, California, Pennsylvania, and Texas have been added as states with programs which are expected to achieve similar emission reductions as the 2016 NSPS OOOOa because additional requirements in these states have been finalized since the promulgation of the 2016 NSPS OOOOa. While the program designs in each of the states differ from the 2016 NSPS OOOOa, for this RIA, the current requirements in California, Colorado, Pennsylvania, and Utah are expected to result in similar overall emissions reductions, while a subset of the requirements in Ohio and Texas are expected to achieve similar emissions reductions. Permit by rule-based requirements in Texas are not included as broadly equivalent to the NSPS requirements in this analysis, while general permits (covering roughly 5.5 percent of the relevant facilities) in Texas are considered equivalent.[87] For roughly 80 percent of the relevant facilities in Ohio, emission reductions from state requirements are considered equivalent. The requirements in Wyoming are

[86] For a more detailed explanation of state programs, see the TSD, as well as the memo "Equivalency of State Fugitive Emissions Programs for Well Sites and Compressor Stations to Proposed Standards at 40 CFR Part 60, Subpart OOOOa", located at Docket ID No. EPA-HQ-OAR-2017-0483.

[87] We do not consider the permit by rule in Texas as equivalent for RIA purposes because these are self-certified permits and we are uncertain about the level of compliance for these permits.

no longer considered to be equivalent for purposes of this RIA because they apply facility-specific permit requirements which do not apply across the entire state. For more information on the states that were examined and why they are or are not considered equivalent, see the TSD and the State memo, both of which are available in the docket.

As discussed in Section 3.1, the EPA is amending the inspection frequency requirements for fugitive emissions components at low production well sites. In the final rule a well site is defined as "low production" if the total combined oil and natural gas production for the well site is less than or equal to 15 boe per day. These sites are excluded from fugitive emissions monitoring requirements but are required to maintain the total well site production at or below 15 boe per day and maintain records to demonstrate production levels. For well sites that have previously been determined to be low production and for which operators later take action (*e.g.*, drills a new well, performs a well workover, etc.) to increase production, the site will again face monitoring requirements if total well site production during the first 30 days of production following completion (or other action intended to increase production from the site) exceeds 15 boe per day.

To estimate the impacts of this provision, it was necessary to estimate the number of well sites that would transition to low production status. We use historical data to estimate the share of sites that transition to low production status as a function of well site age using a combination of Drilling Info data and AEO2020 well drilling projections. The transition percentage is an estimate of the proportion of well sites that transition to low production status as a function of the number of years since completion. The transition percentage also accounts for sites that transitioned from low production status to non-low production status.[88] The low production transition analysis is based on a cross-section of producing wells in 2014 (the base year for the RIA analysis). While it would preferable to perform a time-series analysis of well production decline over a longer period, this population was chosen based on readily available data.

We first estimate the percentage of sites that meet the low production threshold during the first 30 days of production using well-level Drilling Info data for wells completed in 2014. In

[88] As a hypothetical example, if 15 percent of wells transitioned into a low production status and 1 percent transitioned from a low production status into a not-low production status within a given year, the transition percentage would equal 14 percent in that year.

accordance with the model plant analysis presented in the preamble and the TSD, we assume sites have two wells per site. Assuming each of the two wells per model site produces identical quantities of oil and natural gas boe, we approximate the proportion of sites that are initially low production in 2014 (the base year used for well site projections in the RIA) by the proportion of wells producing less than 7.5 boe per day (equivalent to two model plant wells producing fewer than 15 boe per day combined). Using this method, we estimate that about 13 percent of sites would be considered low production based upon the first 30 days of production.[89]

We use the well-level Drilling Info data to estimate the proportion of well sites that change production status in subsequent years as a function of age, accounting for potential transitions from low production status to non-low production status. To this end, for all producing wells in 2014, we characterize each well's initial production status (*i.e.*, during the first 30 days of production) and the well's production status in 2014. Specifically, we categorize a well to be in low production status if production was less than 7.5 boe per day on average in all months of 2014. We cross-tabulate the 2014 production status with the initial production status and the completion year field in the Drilling Info data to estimate the proportion of sites (based on the 2 wells per site assumption) in each of the two categories as a function of age. This cross-tabulation yields information that approximates a decline curve as applied to model well sites. We include completion years from 1999 to 2013 to produce transition proportions for well ages from 1 to 15 years. Figure 3-1 shows the proportion of well sites estimated to have low production status for ages 1 to 15 years.

[89] It is important to note that, under the final rule, production levels are evaluated against the low production threshold at the site level, where sites may have more than one well. While there are comprehensive data available on individual wells, there are no national-level datasets that we are aware of that identify the well sites to which individual wells belong. In addition, we did not receive information in the comment period on the rate at which well sites transition between not-low and low production status. The equal production assumption for model two-well site is the best assumption EPA can come up with to approximate the impacts of the finalized regulatory option.

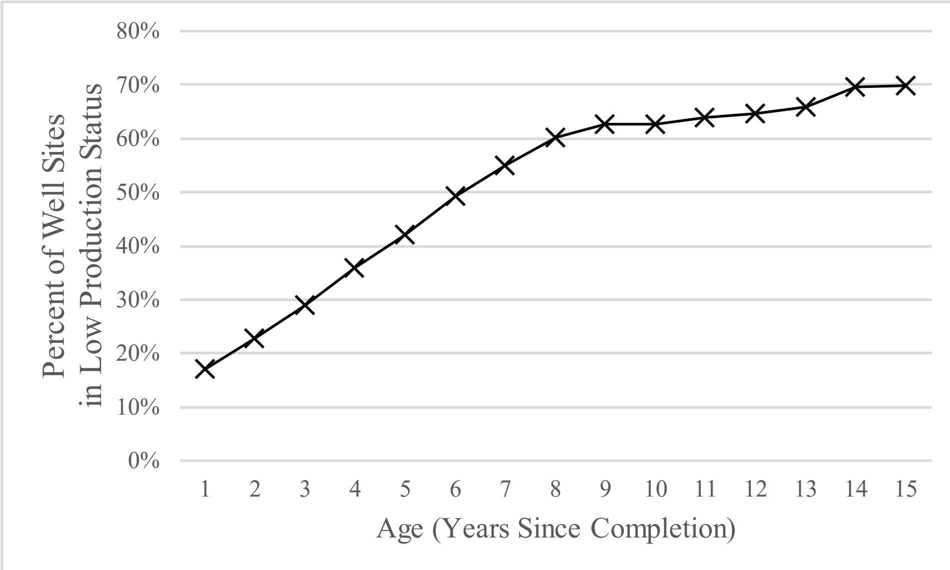

Figure 3-1 Estimated Percent of Well Sites in Low Production Status by Age of Site

We apply these transition percentages to the projected counts of wells sites affected by this final reconsideration. The compliance cost and emissions impacts for sites transitioning into low production status and being relieved of fugitive monitoring requirements are lagged one year due to the 12-month averaging period needed to establish low production status. During the transition year, sites are treated as low production sites for the purposes of assigning compliance costs and emissions impacts, and as non-low production sites for the purposes of assigning a regulatory regime. For example, in the finalized option, if the average daily production of a site in a non-alternative fugitive emissions standard state falls below 15 boe per day during 2020, the site is assumed to incur the cost and emissions impacts associated with a low production site of the monitoring level of a non-low production site (semiannual) in 2020. In 2021, the site is no longer subject to fugitive monitoring requirements.

This analysis relies on a series of assumptions that introduce substantial uncertainties. These uncertainties include the assumption that past production patterns are predictive of future production and the assumption of two wells per site with identical production profiles. The dataset used to estimate the transition proportions excludes wells that were shut-in since completion, which tend to bias estimates of compliance cost and emissions impacts upwards. Lastly, the projection does not separately identify well sites which are wellhead-only, either at the time of completion or later if equipment is removed from the site, and thus not subject to fugitive emissions requirements.

Below, we provide projected source counts in a series of tables. Table 3-3 presents the number of incremental reconsideration-impacted sources for each year of the analysis, broken out by source type. Table 3-4 includes the same information for all reconsideration-impacted sources over the whole period. The total source counts for well sites each year reflect both incrementally affected sources and those affected due to transitions from non-low production to low production status. For example, of the 18,000 low production well sites in 2021, 1,800 are incremental low production sites (see Table 3-3) projected to begin production in 2021. The remainder are non-low production sites that are assumed to have started production between 2015 and 2019 before transitioning to low production status according to the schedule illustrated in Figure 3-1. Finally, Table 3-5 shows the distribution of well sites by production level and alternative fugitive emissions standard status for each year of the analysis.

Table 3-3 Incremental Reconsideration-impacted Source Counts for Finalized Option 3, 2021 to 2030

Year	Non-Low Production Wellsites	Low Production Wellsites	Gathering and Boosting Stations	Certifications	Total
2021	8,400	1,800	210	1,600	12,000
2022	8,800	1,900	210	1,600	12,000
2023	9,000	1,900	210	1,700	13,000
2024	9,200	2,000	210	1,700	13,000
2025	9,300	2,000	210	1,700	13,000
2026	9,400	2,000	210	1,700	13,000
2027	9,400	2,000	210	1,700	13,000
2028	9,500	2,000	210	1,700	13,000
2029	9,500	2,000	210	1,700	14,000
2030	9,500	2,000	210	1,700	13,000

Note: Incrementally reconsideration-impacted sources include sources that are newly affected in each year. Estimates may not sum due to independent rounding.

Table 3-4 Total Reconsideration-impacted Source Counts for Finalized Option 3, 2021 to 2030

Year	Non-Low Production Wellsites	Low Production Wellsites	Gathering and Boosting Stations	Certifications	Total
2021	42,000	18,000	1,500	1,600	63,000
2022	48,000	23,000	1,700	1,600	74,000
2023	54,000	28,000	1,900	1,700	85,000
2024	59,000	33,000	2,100	1,700	97,000
2025	65,000	39,000	2,300	1,700	110,000
2026	70,000	46,000	2,500	1,700	120,000
2027	75,000	52,000	2,800	1,700	130,000
2028	80,000	59,000	3,000	1,700	140,000
2029	84,000	66,000	3,200	1,700	150,000
2030	88,000	73,000	3,400	1,700	170,000

Note: Total reconsideration-impacted sources include sources that are projected to change their activity as a result of the reconsideration in each year. These include sources that are newly affected in each year plus the sources from previous years that experience a change in their compliance activity as a result of this final action compared to the baseline. The table does not include estimated counts of NSPS-affected facilities whose controls are unaffected by the reconsideration. Estimates may not sum due to independent rounding.

Table 3-5 Reconsideration-impacted Well Site Counts by Alternative Fugitive Emissions Standards Status for Finalized Option 3, 2021 to 2030

Year	Non-Alternative Fugitive Emissions Standard State		Alternative Fugitive Emissions Standard State	
	Non-Low Production Wellsites	Low Production Wellsites	Non-Low Production Wellsites	Low Production Wellsites
2021	34,000	14,000	7,800	4,600
2022	39,000	17,000	8,900	5,600
2023	44,000	21,000	9,900	6,800
2024	48,000	25,000	11,000	8,000
2025	53,000	30,000	12,000	9,400
2026	57,000	35,000	13,000	11,000
2027	61,000	40,000	14,000	12,000
2028	65,000	45,000	15,000	14,000
2029	68,000	51,000	16,000	15,000
2030	72,000	57,000	16,000	17,000

Note: Projected sources under alternative fugitive emissions standard include all reconsideration-impacted well sites in California, Colorado, Pennsylvania, and Utah; 80 percent of well sites in Ohio; and 5.5 percent of well sites in Texas.

3.2.4 Forgone Emissions Reductions

Table 3-6 summarizes the estimated forgone emissions reductions associated with the finalized Option 3 compared to the baseline. Increases in emissions are estimated by multiplying the source-level increases in emissions from the updated baseline by the corresponding projected number of reconsideration-affected facilities. In the analysis, streamlined elements of the fugitive emissions monitoring requirements and closed vent system and technical infeasibility certification requirements are not associated with any direct emissions changes.[90] Therefore, all forgone emissions reductions are attributed to the frequency changes in the fugitive emissions monitoring program.[91] This does not include projected impacts on emissions from this final action resulting from reducing the monitoring frequency for affected compressor stations on the Alaska North Slope because, as noted, the EPA does not sufficient information on compressor stations there. Also, as noted in Section 3.2.1, some additional provisions included in the preamble are not analyzed because we either do not have the data to do so or because we do not think the provision will lead to measurable cost reductions or emission changes.

Table 3-6 Forgone Emissions Reductions under Finalized Option 3, 2021 to 2030

	Emission Changes			
	Methane (short tons)	**VOC (short tons)**	**HAP (short tons)**	**Methane (metric tons CO_2 Eq.)**
2021	19,000	5,200	200	430,000
2022	23,000	6,500	250	530,000
2023	28,000	7,900	300	650,000
2024	34,000	9,500	360	780,000
2025	40,000	11,000	420	910,000
2026	47,000	13,000	490	1,100,000
2027	53,000	15,000	560	1,200,000
2028	60,000	17,000	630	1,400,000
2029	68,000	19,000	710	1,500,000
2030	75,000	21,000	790	1,700,000
Total	450,000	120,000	4,700	10,000,000

Note: Estimates may not sum due to independent rounding.

[90] Streamlined elements of the fugitive emissions monitoring requirements include the removal of site map and observation path requirements in the monitoring plan and a reduction in the information required to be recorded and reported. After review of the specific requirements, for reasons explained in the Section V of the preamble to the final rule, several elements of the existing program were deemed redundant or not critical to demonstrating compliance with the rule. Emissions should not be affected by the change in certification requirements to the extent that the use of an in-house engineer does not result in any change in the quality of closed vent systems being certified or the number of pneumatic pump technical infeasibility determinations. We do not have the information needed to estimate the potential for emissions impacts, if any, when moving from professional engineer certifications to in-house engineer certifications.

[91] Note that we estimate no change in emissions for well sites projected to be covered under equivalent state programs as discussed in Section 3.2.2.

3.2.5 Forgone Product Recovery

Fugitive emissions monitoring is assumed to increase the capture of methane and VOC emissions that would otherwise be vented to the atmosphere with no fugitive emissions monitoring program, and we assume that a large proportion of the averted methane emissions can be directed into natural gas production streams and sold. In this analysis, we estimate the forgone revenue associated with the decrease in natural gas recovery due to this final action. Reducing the frequency of the monitoring program leads to a reduction in the amount of natural gas that is assumed to be captured and sold, leading to forgone revenue as compared to the baseline.

When including the decrease in natural gas recovery in the cost reductions analysis, we use the projections of natural gas prices provided in the EIA's AEO2020 reference case. The AEO projects Henry Hub natural gas prices rising from $2.49/MMBtu in 2021 to $3.29/MMBtu in 2030 in 2019 dollars.[92] To be consistent with other financial estimates in the RIA, we adjust the projected prices from AEO2020 from 2019 to 2016 dollars using the GDP-Implicit Price Deflator. We also adjust to reflect an estimate of prices at the wellhead using an EIA study result that indicated that the Henry Hub price is, on average, about 11 percent higher than the wellhead price and using the conversion of 1.036 MMBtu equals 1 Mcf.[93] After these adjustments, the wellhead natural gas prices are assumed to rise from $2.20/Mcf in 2021 to $2.89/Mcf in 2030. Table 3-7 summarizes the decrease in natural gas recovery and the associated forgone revenue included in the cost reductions calculations for the finalized Option 3. Option 3, which reduces the frequency of the fugitive monitoring program for compressor stations and eliminates monitoring requirements entirely for low-production well sites, leads to a projected reduction in the amount of natural gas that is assumed to be captured and sold ranging from 1.1 in 2021 to 4.4 bcf in 2030; in turn, this leads to forgone revenue ranging from $2.4 million in 2021 to $13

[92] Available at: http://www.eia.gov/forecasts/aeo/tables_ref.cfm.
[93] See: https://www.researchgate.net/publication/265155970_US_Natural_Gas_Markets_Relationship_Between_Henry_Hub_Spot_Prices_and_US_Wellhead_Prices. Accessed 12/16/2019.

million in 2030.[94] Detailed results for forgone revenues for natural gas recovery associated with all options are presented in Section 3.2.8.

Table 3-7 Decrease in Natural Gas Recovery for Finalized Option 3, 2021 to 2030

Year	Decrease in Gas Recovery (Mcf)	Forgone Revenue (millions 2016$)
2021	1.1	$2.4
2022	1.4	$3.0
2023	1.7	$3.7
2024	2.0	$4.6
2025	2.3	$5.8
2026	2.7	$7.3
2027	3.1	$8.8
2028	3.5	$10
2029	3.9	$11
2030	4.4	$13

3.2.6 Compliance Cost Reductions

Table 3-8 summarizes the cost reductions and forgone revenue from product recovery for the evaluated emissions sources and points. The annual operating and maintenance cost reductions are all attributed to the fugitives monitoring requirement and include the cost of performing the surveys, as well as the costs associated with repairs. The planning cost reductions in Table 3-8 represent reductions in the total planning cost expenditures for affected sources, including the change in planning costs for sources affected prior to the analysis year. The cost reductions are estimated by multiplying the source-level cost reductions relative to the updated baseline associated with applicable control and facility type, discussed in Section 3.2.2, by the number of incrementally affected sources of that facility type, discussed in Section 3.2.3. The cost

[94] Operators in the gathering and boosting part of the industry do not typically own the natural gas they transport; rather, the operators receive payment for the transportation service they provide. As a result, the source-level cost and emission reduction analyses supporting best system of emission reduction (BSER) decisions presented in Volume 1 of the TSD do not include estimates of revenue from natural gas recovery as offsets to compliance costs. From a social perspective, however, the increased financial returns from natural gas recovery accrues to entities somewhere along the natural gas supply chain and should be accounted for in the national impacts analysis. An economic argument can be made that, in the long run, no single entity is going to bear the entire burden of the compliance costs or fully receive the financial gain of the additional revenues associated with natural gas recovery. The change in economic surplus resulting from natural gas recovery is going to be spread out among different agents via price mechanisms. Therefore, the most simple and transparent option for allocating these revenues would be to keep the compliance costs and associated revenues together in a given source category and not add assumptions regarding the allocation of revenues across agents. Also, see the discussion regarding opportunity costs associated investing in pollution abatement capital vs. productive capital in Chapter 2.

reductions from the streamlining of recordkeeping and reporting are included in the annualized cost reductions totals.[95] These cost reductions are described more below.

Table 3-8 Estimated Cost Reductions for Finalized Option 3, 2021 to 2030 (millions 2016$)

Year	Planning Cost Reductions[1]	Operating and Maintenance Cost Reductions	Annualized Cost Reductions (w/o Forgone Revenue)[2]	Forgone Revenue from Product Recovery	Annualized Cost Reductions (with Forgone Revenue)
2021	$6.9	$52	$59	$2.4	$57
2022	$7.2	$62	$71	$3.0	$68
2023	$15	$74	$84	$3.7	$80
2024	$11	$87	$98	$4.6	$93
2025	$12	$100	$110	$5.8	$110
2026	$14	$110	$130	$7.3	$120
2027	$14	$130	$140	$8.8	$130
2028	$14	$140	$160	$10	$150
2029	$15	$160	$180	$11	$160
2030	$15	$170	$190	$13	$180

Note: Estimates may not sum due to independent rounding.
[1] The planning cost reductions include the cost reductions incurred by the newly affected sources for both fugitive emissions monitoring and certifications in each year, as well as the cost reductions of fugitive emissions sources that renew survey monitoring plans after 8 years.
[2] These cost reductions include the planning cost reductions for all fugitive emissions monitoring requirements annualized over 8 years at an interest rate of 7 percent, plus the annual operating and maintenance cost reductions for fugitive emissions monitoring, plus the certification cost reductions, plus the cost reductions from streamlined recordkeeping and reporting.

The cost of designing, or redesigning, the fugitive emissions monitoring program occurs every 8 years to comply with the 2016 NSPS OOOOa requirements. The lifetime of the monitoring program is not changed by this reconsideration. The reduction in planning costs in each year outlined in Table 3-8 includes the estimated reduction in the costs of designing a fugitive emissions monitoring program for the new reconsideration-impacted sources in that year, plus the reduction in the cost of redesigning an existing program for sources that were affected by the reconsideration previously. The first year a redesign cost is included in the planning cost reduction calculation is 2023, as we assume the first NSPS-affected sources completed monitoring plans in 2016, the first year the 2016 NSPS OOOOa affected sources completed compliance activities. The decrease in these program design costs were added to the cost

[95] See the preamble of the final reconsideration for details on the changes to the recordkeeping and reporting requirements.

reductions associated with closed vent system design and technical infeasibility certifications in each year to get the total planning cost reductions for each year.

The fugitive emissions monitoring planning cost reductions, annualized over the expected lifetime of 8 years at an interest rate of 7 percent, are added to the annual cost reductions of associated with fugitive emissions monitoring, the cost reductions associated with certifications, and the cost reductions from streamlined recordkeeping and reporting to get the annualized cost reductions in each year compared to the baseline. The value of forgone product recovery is also subtracted out to estimate the total annualized cost impacts in each year.
Table 3-9 illustrates the sensitivity of the compliance cost and emissions results of the finalized Option 3 to changes in the interest rate. We present costs using interest rates of 7 percent and 3 percent. Table 3-9 shows that the interest rate has minor effects on the nationwide annualized cost reductions of the Technical Reconsideration.

Table 3-9 Estimated Cost Reductions for Finalized Option 3 at 3 and 7 Percent Interest Rates, 2021 to 2030 (millions 2016$)

	7 Percent			3 Percent		
Year	Annualized Cost Reductions (w/o Forgone Revenue)	Forgone Revenue from Product Recovery	Annualized Cost Reductions (with Forgone Revenue)	Annualized Cost Reductions (w/o Forgone Revenue)	Forgone Revenue from Product Recovery	Annualized Cost Reductions (with Forgone Revenue)
2021	$59	$2.4	$57	$58	$2.4	$56
2022	$71	$3.0	$68	$70	$3.0	$67
2023	$84	$3.7	$80	$83	$3.7	$79
2024	$98	$4.6	$93	$97	$4.6	$92
2025	$110	$5.8	$110	$110	$5.8	$110
2026	$130	$7.3	$120	$130	$7.3	$120
2027	$140	$8.8	$130	$140	$8.8	$130
2028	$160	$10	$150	$160	$10	$150
2029	$180	$11	$160	$170	$11	$160
2030	$190	$13	$180	$190	$13	$180

Note: Estimates may not sum due to independent rounding.

3.2.7 Comparison of Regulatory Alternatives

Table 3-10 presents a comparison of projected emissions and compliance cost impacts of the regulatory alternatives in 2021 and 2030. The most stringent option, Option 1, would not change the fugitive emissions monitoring frequency requirements in the 2016 NSPS OOOOa. As a result, there are no changes in projected emissions compared to the baseline for Option 1. However, there are cost reductions from streamlining fugitive emissions monitoring, certifying several state programs as having an alternative fugitive emissions standard, and allowing the use of in-house engineers for certifications. For Option 2, in addition to the changes in requirements captured in Option 1, fugitive emissions monitoring requirements are removed for low production well sites (semiannual under the baseline). We assume 60 percent emissions reductions for semiannual fugitive monitoring.[96] Compliance costs and natural gas recovery vary by survey frequency. The finalized Option 3 is the same as Option 2 but decreases the fugitive emissions monitoring frequency at gathering and boosting stations from quarterly to semiannual. We assume 80 percent emissions reductions for a quarterly fugitive emissions monitoring requirement.

Table 3-10 Comparison of Regulatory Alternatives in 2021 and 2030

	Regulatory Alternative		
	Option 1	**Option 2**	**Option 3 (Finalized)**
Total Impacts, 2021			
Forgone emissions reductions			
Methane Emissions (short tons/year)	0	14,000	19,000
VOC Emissions (short tons/year)	0	3,900	5,200
Decrease in Natural Gas Recovery (bcf)	0	0.8	1.1
Cost Reductions			
Planning Cost Reductions	$5.7	$6.9	$6.9
Annualized Cost Reductions w/o Forgone Revenue (7 percent)	$30	$52	$59
Annualized Cost Reductions with Forgone Revenue (7 percent)	$30	$51	$57
Total Impacts, 2030			
Forgone emissions reductions			
Methane Emissions (short tons/year)	0	64,000	75,000
VOC Emissions (short tons/year)	0	18,000	21,000
Decrease in Natural Gas Recovery (bcf)	0	3.7	4.4
Cost Reductions			
Planning Cost Reductions	$9.8	$15	$15
Annualized Cost Reductions w/o Forgone Revenue (7 percent)	$76	$180	$190
Annualized Cost Reductions with Forgone Revenue (7 percent)	$76	$170	$180

[96] See the TSD for more details on the emission reductions assumptions across fugitive monitoring survey frequencies at well sites and compressor stations.

As shown in Table 3-10, Option 1 is projected to result in no changes in emissions and annualized cost reductions are projected to be $30 million in 2021 and $76 million in 2030. Option 2 is projected to result in a decrease in annualized compliance costs of $51 million in 2021 and $170 million in 2030 after accounting for decreased product recovery. Emissions are projected to increase by 14,000 short tons of methane and 3,900 short tons of VOC in 2021 and 64,000 short tons of methane and 18,000 short tons of VOC in 2030. The finalized Option 3 is projected to result in the largest cost reductions and forgone emissions reductions. Option 3 is projected to decrease annualized costs by $57 million in 2021 and $180 million in 2030 after accounting for the value of forgone product recovery. Option 3 is projected to increase emissions by 19,000 short tons of methane and 5,200 short tons of VOC in 2021 and 75,000 short tons of methane and 21,000 short tons of VOC in 2030.

3.2.8 Detailed Impact Tables

The following tables show the full details of the cost reductions and forgone emissions reductions by emissions source for each regulatory option in the years 2021 and 2030.

Table 3-11 Incrementally Affected Sources, Forgone Emissions Reductions, and Cost Reductions, Option 1, 2021

Source/Emissions Point	Projected No. of Reconsideration-impacted Sources	Forgone Emissions Reductions: Methane (short tons)	VOC (short tons)	HAP (short tons)	Methane (metric tons CO_2 Eq.)	Compliance Cost Reductions (millions $2016): Annualized Planning Cost Reductions	Operating and Maintenance	Forgone Product Recovery	Total Annualized Cost Reductions with Forgone Revenues
Fugitive Emissions									
Non-Low Production Well Sites	42,000	0	0	0	0	$2.3	$16	$0	$18
Low Production Well Sites	18,000	0	0	0	0	$0.90	$7.1	$0	$8.0
Gathering and Boosting Stations	1,500	0	0	0	0	$0.099	$1.0	$0	$1.1
Certifications									
CVS and Technical Infeasibility	1,600	0	0	0	0	$2.5	$0	$0	$2.5
TOTAL	**63,000**	**0**	**0**	**0**	**0**	**$5.7**	**$24**	**$0**	**$30**

Note: Estimates may not sum due to independent rounding.

Table 3-12 Incrementally Affected Sources, Forgone Emissions Reductions, and Cost Reductions, Option 1, 2030

Source/Emissions Point	Projected No. of Reconsideration-impacted Sources	Forgone Emissions Reductions: Methane (short tons)	VOC (short tons)	HAP (short tons)	Methane (metric tons CO_2 Eq.)	Compliance Cost Reductions (millions $2016): Annualized Planning Cost Reductions	Operating and Maintenance	Forgone Product Recovery	Total Annualized Cost Reductions with Forgone Revenues
Fugitive Emissions									
Non-Low Production Well Sites	88,000	0	0	0	0	$4.8	$34	$0	$38
Low Production Well Sites	73,000	0	0	0	0	$3.8	$28	$0	$32
Gathering and Boosting Stations	3,400	0	0	0	0	$0.23	$2.2	$0	$2.4
Certifications									
CVS and Technical Infeasibility	1,700	0	0	0	0	$2.7	$0	$0	$2.7
TOTAL	**170,000**	**0**	**0**	**0**	**0**	**$11**	**$64**	**$0**	**$76**

Note: Estimates may not sum due to independent rounding.

Table 3-13 Incrementally Affected Sources, Forgone Emissions Reductions, and Cost Reductions, Option 2, 2021

Source/Emissions Point	Projected No. of Reconsideration-impacted Sources	Forgone Emissions Reductions: Methane (short tons)	VOC (short tons)	HAP (short tons)	Methane (metric tons CO_2 Eq.)	Compliance Cost Reductions (millions $2016): Annualized Planning Cost Reductions	Operating and Maintenance	Forgone Product Recovery	Total Annualized Cost Reductions with Forgone Revenues
Fugitive Emissions									
Non-Low Production Well Sites	42,000	0	0	0	0	$2.3	$16	$0	$18
Low Production Well Sites	18,000	14,000	3,900	150	320,000	$2.8	$28	$1.8	$29
Gathering and Boosting Stations	1,500	0	0	0	0	$0.099	$1.0	$0	$1.1
Certifications									
CVS and Technical Infeasibility	1,600	0	0	0	0	$2.5	$0	$0	$2.5
TOTAL	**63,000**	**14,000**	**3,900**	**150**	**320,000**	**$7.6**	**$45**	**$1.8**	**$51**

Note: Estimates may not sum due to independent rounding.

Table 3-14 Incrementally Affected Sources, Forgone Emissions Reductions, and Cost Reductions, Option 2, 2030

Source/Emissions Point	Projected No. of Reconsideration-impacted Sources	Forgone Emissions Reductions: Methane (short tons)	VOC (short tons)	HAP (short tons)	Methane (metric tons CO_2 Eq.)	Compliance Cost Reductions (millions $2016): Annualized Planning Cost Reductions	Operating and Maintenance	Forgone Product Recovery	Total Annualized Cost Reductions with Forgone Revenues
Fugitive Emissions									
Non-Low Production Well Sites	88,000	0	0	0	0	$4.8	$34	$0	$38
Low Production Well Sites	73,000	64,000	18,000	670	1,500,000	$12	$120	$11	$120
Gathering and Boosting Stations	3,400	0	0	0	0	$0.23	$2.2	$0	$2.4
Certifications									
CVS and Technical Infeasibility	1,700	0	0	0	0	$2.7	$0	$0	$2.7
TOTAL	**170,000**	**64,000**	**18,000**	**670**	**1,500,000**	**$20**	**$160**	**$11**	**$170**

Note: Estimates may not sum due to independent rounding.

Table 3-15 Incrementally Affected Sources, Forgone Emissions Reductions, and Cost Reductions, Finalized Option 3, 2021

		Forgone Emissions Reductions				Compliance Cost Reductions (millions $2016)			
Source/Emissions Point	Projected No. of Reconsideration-impacted Sources	Methane (short tons)	VOC (short tons)	HAP (short tons)	Methane (metric tons CO_2 Eq.)	Planning Cost Reductions	Operating and Maintenance	Forgone Product Recovery	Total Annualized Cost Reductions with Forgone Revenues
Fugitive Emissions									
Non-Low Production Well Sites	42,000	0	0	0	0	$2.3	$16	$0	$18
Low Production Well Sites	18,000	14,000	3,900	150	320,000	$2.8	$28	$1.8	$29
Gathering and Boosting Stations	1,500	4,900	1,400	52	110,000	$0.10	$7.8	$0.63	$7.3
Certifications									
CVS and Technical Infeasibility	1,600	0	0	0	0	$2.5	$0	$0	$2.5
TOTAL	**63,000**	**19,000**	**5,200**	**200**	**430,000**	**$7.6**	**$52**	**$2.4**	**$57**

Note: Estimates may not sum due to independent rounding.

Table 3-16 Incrementally Affected Sources, Forgone Emissions Reductions, and Cost Reductions, Finalized Option 3, 2030

		Forgone Emissions Reductions				Compliance Cost Reductions (millions $2016)			
Source/Emissions Point	Projected No. of Reconsideration-impacted Sources	Methane (short tons)	VOC (short tons)	HAP (short tons)	Methane (metric tons CO_2 Eq.)	Planning Cost Reductions	Operating and Maintenance	Forgone Product Recovery	Total Annualized Cost Reductions with Forgone Revenues
Fugitive Emissions									
Non-Low Production Well Sites	88,000	0	0	0	0	$4.8	$34	$0	$38
Low Production Well Sites	73,000	64,000	18,000	670	1,500,000	$12	$120	$11	$120
Gathering and Boosting Stations	3,400	11,000	3,100	120	260,000	$0.23	$18	$1.9	$16
Certifications									
CVS and Technical Infeasibility	1,700	0	0	0	0	$2.7	$0	$0	$2.7
TOTAL	**170,000**	**75,000**	**21,000**	**790**	**1,700,000**	**$20**	**$170**	**$13**	**$180**

Note: Estimates may not sum due to independent rounding.

3.2.9 Present Value and Equivalent Annualized Value of Cost Reductions

This section presents the cost reductions for this final action in a present value (PV) framework. The stream of estimated cost reductions for each year from 2021 through 2030 is discounted to 2020 using 7 and 3 percent discount rates and summed to estimate the PV of the cost reductions. This PV represents the sum of the annual cost reductions from 2021 to 2030. The PV is used to estimate the equivalent annualized value (EAV) of the cost reductions. The EAV is the single annual value which, if summed in PV terms across years in the analytical time frame, equals the PV of the original (*i.e.*, likely time-varying) stream of cost reductions. In other words, the EAV takes the potentially "lumpy" stream of cost reductions and converts them into a single value that, when discounted and added together over each period in the analysis time frame, equals the original stream of values in PV terms.

The cost reductions are presented as the change in costs compared to the baseline in 2016 dollars. We evaluate the change in costs for each year where reconsideration-impacted sources are expected to change their compliance activities from the 2016 NSPS OOOOa as a result of this reconsideration, through 2030. For this final action, the change in compliance activities is expected to lead to cost reductions. We have chosen not to evaluate impacts beyond 2030 in part due to the limited information available to model long-term changes in practices and equipment use in the oil and natural gas sector. Technological progress in control technology and other economy-wide factors are likely to change the industry significantly over a longer time horizon.

Table 3-17 shows the unannualized, undiscounted stream of cost reductions for each year from 2021 to 2030. Planning cost reductions are estimated as the sum of the difference in costs of the design of fugitive emissions monitoring plans for new reconsideration-impacted facilities, the difference in costs of the redesign of fugitive emissions monitoring plans for reconsideration-impacted facilities that were affected by the 2016 NSPS OOOOa 8 years prior, and the difference in costs of certification for closed vent system design and pneumatic pump technical infeasibility for new reconsideration-impacted sources compared to the updated baseline. Total cost reductions are the sum of the planning cost reductions and annual operating cost reductions. Over time, as the number of new reconsideration-affected sources increases, the planning cost reductions and annual operating cost reductions also increase.

Table 3-17 Estimated Cost Reductions for Finalized Option 3, 2021 to 2030 (millions 2016$)

Year	Planning Cost Reductions[1]	Operating and Maintenance Cost Reductions	Total Cost Reductions (w/o Forgone Revenue)[2]	Forgone Revenue from Product Recovery	Total Cost Reductions (with Forgone Revenue)
2021	$6.9	$52	$59	$2.4	$56
2022	$7.2	$62	$70	$3.0	$67
2023	$15	$74	$89	$3.7	$85
2024	$11	$87	$98	$4.6	$93
2025	$12	$100	$110	$5.8	$110
2026	$14	$110	$130	$7.3	$120
2027	$14	$130	$140	$8.8	$130
2028	$14	$140	$160	$10	$150
2029	$15	$160	$170	$11	$160
2030	$15	$170	$190	$13	$180

Note: Estimates may not sum due to independent rounding.
[1] The planning cost reductions include the cost reductions incurred by the newly affected sources for both fugitive emissions monitoring and certifications, as well as the cost reductions of emissions sources that renew survey monitoring plans after 8 years.
[2] Total cost reductions include the planning cost reductions for all fugitive emissions monitoring, plus the annual operating and maintenance cost reductions for the fugitive emissions monitoring requirements every year, plus the cost reductions of certifications in each year, plus the cost reductions from streamlined recordkeeping and reporting.

Table 3-18 shows the stream of cost reductions discounted to 2020 using a 7 percent discount rate for the finalized Option 3. Table 3-18 also shows the PV and the EAV of planning cost reductions, annual operating cost reductions, forgone revenue from decreased product recovery and the total cost reductions (after accounting for the forgone product recovery). The PV of total cost reductions is $750 million, and the EAV of total cost reductions is about $100 million per year.

Table 3-18 Discounted Cost Reductions Estimates for Finalized Option 3, 7 Percent Discount Rate (millions 2016$)

Year	Planning Cost Reductions[1]	Operating and Maintenance Cost Reductions	Total Cost Reductions (w/o Forgone Revenue)[2]	Forgone Revenue from Product Recovery	Total Cost Reductions (with Forgone Revenue)
2021	$6.5	$48	$55	$2.2	$52
2022	$6.3	$55	$61	$2.6	$58
2023	$12	$61	$73	$3.0	$70
2024	$8.5	$66	$75	$3.5	$71
2025	$8.7	$71	$80	$4.2	$76
2026	$9.2	$76	$85	$4.9	$80
2027	$8.7	$80	$88	$5.5	$83
2028	$8.4	$83	$91	$5.9	$85
2029	$8.0	$85	$93	$6.2	$87
2030	$7.7	$88	$95	$6.4	$89
PV	**$84**	**$710**	**$800**	**$44**	**$750**
EAV	**$11**	**$95**	**$110**	**$5.9**	**$100**

Note: Cost reductions and forgone revenue in each year are discounted to 2020. Estimates may not sum due to independent rounding.
[1] The planning cost reductions include the cost reductions incurred by the newly affected sources for both fugitive emissions monitoring and certifications in each year, as well as the fugitive monitoring cost reductions for sources that renew their monitoring plans after 8 years.
[2] Total cost reductions include the planning cost reductions for all fugitive emissions monitoring, plus the annual operating and maintenance cost reductions for the fugitive emissions monitoring requirements every year, plus the cost reductions of certifications in each year, plus the cost reductions from streamlined recordkeeping and reporting discounted to 2020.

Table 3-19 shows the discounted cost reductions for the finalized Option 3, as well as the alternative options, for the 2021 to 2030 period compared to the baseline, along with the PV and EAV of the cost reductions, using a 7 percent discount rate. We estimate that Option 1 results in a PV of cost reductions of $350 million, corresponding to an EAV of $46 million. For Option 2, we estimate a PV of cost reductions of $680 million, after accounting for the forgone value of the decrease in product recovery, and a corresponding EAV of $91 million. For the finalized Option 3, we estimate a PV of $750 million in cost reductions after accounting for forgone product recovery, and about $100 million per year in EAV terms.

Table 3-19 Comparison of Regulatory Alternatives, 7 Percent Discount Rate

	Option 1	Option 2	Option 3 (Finalized)
Present Value of Cost Reductions			
Cost Reductions (millions 2016$)			
Planning Cost Reductions	$58	$84	$84
Total Cost Reductions w/o Forgone Revenue	$350	$720	$800
Total Cost Reductions with Forgone Revenue	$350	$680	$750
EAV of Cost Reductions			
Cost Reductions (millions 2016$)			
Planning Cost Reductions	$7.8	$11	$11
Total Cost Reductions w/o Forgone Revenue	$46	$96	$110
Total Cost Reductions with Forgone Revenue	$46	$91	$100

Table 3-20 shows how the choice of discount rate affects the PVs and EAVs. A lower discount rate means that higher cost reductions in later years have a greater impact on PV and EAV. Therefore, the PV and EAV of the cost reductions are higher using a 3 percent discount rate than a 7 percent discount rate. Using a 3 percent discount rate increases the PV of the cost reductions by 27 percent compared to the 7 percent rate. For the EAV, using a 3 percent discount rate increases the annualized cost reductions by about 15 percent compared to the 7 percent rate.

Table 3-20 Cost Reductions for the Finalized Option 3 Discounted at 7 and 3 Percent Rates (millions 2016$)

	7 Percent			3 Percent		
Year	**Total Annual Cost Reductions (without forgone revenue)**	**Forgone Revenue from Product Recovery**	**Total Cost Reductions (with forgone revenue)[1]**	**Total Annual Cost Reductions (without forgone revenue)**	**Forgone Revenue from Product Recovery**	**Total Cost Reductions (with forgone revenue)[1]**
2021	$55	$2.2	$52	$57	$2.3	$55
2022	$61	$2.6	$58	$66	$2.8	$63
2023	$73	$3.0	$70	$81	$3.4	$78
2024	$75	$3.5	$71	$87	$4.0	$83
2025	$80	$4.2	$76	$97	$5.0	$92
2026	$85	$4.9	$80	$110	$6.1	$100
2027	$88	$5.5	$83	$120	$7.2	$110
2028	$91	$5.9	$85	$120	$8.1	$120
2029	$93	$6.2	$87	$130	$8.8	$120
2030	$95	$6.4	$89	$140	$9.4	$130
PV	**$800**	**$44**	**$750**	**$1,000**	**$57**	**$950**
EAV	**$110**	**$5.9**	**$100**	**$110**	**$6.5**	**$110**

Note: Cost reductions in each year are discounted to 2020. Estimates may not sum due to independent rounding.
1 Total cost reductions include the planning cost reductions for all fugitive emissions monitoring, plus the annual operating and maintenance cost reductions for the fugitive emissions monitoring requirements every year, plus the

cost reductions of certifications in each year, plus the cost reductions from streamlined recordkeeping and reporting requirements discounted to 2020.

The Technical Reconsideration is considered a deregulatory action under E.O. 13771, Reducing Regulation and Controlling Regulatory Costs. The PV of the projected cost reductions from the Technical Reconsideration calculated in accordance with E.O. 13771 accounting standards are $1.1 billion over an infinite time horizon (in 2016$, discounted to 2016 at 7 percent). The EAV of the cost reductions over an infinite time horizon are $76 million per year (in 2016$, discounted to 2016 at 7 percent).

3.3 Forgone Benefits of the Technical Reconsideration

The 2016 NSPS OOOOa regulated methane and VOC emissions in the oil and natural gas sector. For the 2016 NSPS OOOOa, the EPA projected climate and ozone benefits from methane reductions, ozone and fine particulate matter ($PM_{2.5}$) health benefits from VOC reductions, and health benefits from ancillary HAP emissions reduction. These benefits were expected because compliance with the standards would simultaneously reduce methane, VOC, and HAP emissions.[97]

As in the 2016 NSPS RIA, methane is the only pollutant with monetized impacts in this RIA. The finalized Option 3 is estimated to increase emissions relative to the baseline. The total forgone emissions reductions from 2021 to 2030 is estimated to be about 450,000 short tons of methane, 120,000 short tons of VOC and 4,700 short tons of HAP. The methane emissions are 10 million metric tons in CO_2 Eq. The PV of the forgone domestic methane-related climate benefits is $19 million from 2021 to 2030 using an interim estimate of the domestic social cost of methane (SC-CH_4) and discounting at a 7 percent rate. The associated EAV is an estimated $3.2 million per year. Using the interim SC-CH_4 estimate and discounting at a 3 percent rate, the PV of the forgone domestic climate benefits is estimated to be $71 million and the EAV is estimated to be $11 million per year.

[97] The specific control techniques required for the 2016 NSPS OOOOa were also anticipated to have minor disbenefits resulting from secondary emissions of carbon dioxide (CO_2), nitrogen oxides (NO_X), PM, carbon monoxide (CO), and total hydrocarbons (THC), and emission changes associated with the energy markets impacts. This final action is anticipated to reduce these minor secondary emissions.

Under the final action, the EPA expects that the forgone VOC emission reductions will worsen air quality and adversely affect health and welfare due to the contribution of VOCs to ozone, $PM_{2.5}$, and HAP, but we are unable to quantify these impacts at this time. This omission should not imply that these forgone benefits do not exist, and to the extent that the EPA were to quantify the ozone and PM impacts, it would estimate the number and value of avoided premature deaths and illnesses using the approach detailed in the PM National Ambient Air Quality Standards (NAAQS) and Ozone NAAQS RIAs (U.S. EPA, 2012; U.S. EPA, 2014).[98]

For much of Section 3.3, we direct readers to refer to the forgone benefits presentation in Chapter 2 (Section 2.3), as the forgone benefits analysis for the Technical Reconsideration mirrors the one for the Policy Review. For a summary of the climate and human health-related impacts associated with the forgone emissions reductions of the pollutants affected by this rule, see Table 2-12 in Section 2.3.1. Section 2.3 provides further reasoning for not quantifying the impacts of the forgone VOC emissions reductions in this RIA.

3.3.1 Forgone Emissions Reductions

Table 3-21 shows the total increase in direct emissions for 2021 to 2030, compared to the baseline, anticipated for this final action for the regulatory options examined. It is important to note that the impacts of these emissions accrue at different spatial scales. HAP emissions increase exposure to carcinogens and other toxic pollutants primarily near the emission source. VOC emissions are precursors to the formation of $PM_{2.5}$ and ozone on a broader regional scale. Climate effects associated with long-lived greenhouse gases like methane generally do not depend on the location of the emissions and have global impacts. Methane is also a precursor to global background concentrations of ozone (Sarofim, 2015).

[98] The Technical Reconsideration may result in forgone reductions in ambient $PM_{2.5}$ and ozone concentrations in areas attaining and not attaining the NAAQS. Due to the high degree of variability in the responsiveness of ozone and $PM_{2.5}$ formation to VOC emission reductions, we are unable to determine how this rule might affect attainment status without modeling air quality changes. Because the NAAQS RIAs also calculate ozone and $PM_{2.5}$ benefits, there are important differences worth noting in the design and analytical objectives of each impact analysis. The NAAQS RIAs illustrate the potential costs and benefits of attaining new nationwide air quality standards based on an array of emission control strategies for different sources. By contrast, the emission reductions for implementation rules, including this rule, are generally from a specific class of well-characterized sources. In general, the EPA is more confident in the magnitude and location of the emission reductions for implementation rules rather than illustrative NAAQS analyses. Emission changes realized under these and other promulgated rules will ultimately be reflected in the baseline of future NAAQS analyses, which would affect the incremental costs and benefits associated with attaining future NAAQS.

Table 3-21 Total Direct Increases in Emissions, 2021 through 2030

Pollutant	Option 1	Option 2	Option 3 (Finalized)
Methane (short tons)	0	370,000	450,000
VOC (short tons)	0	100,000	120,000
HAP (short tons)	0	3,800	4,700
Methane (metric tons)	0	330,000	410,000
Methane (million metric tons CO_2 Eq.)	0	8.3	10

Table 3-22 shows the direct increases in emissions of methane, VOC, and HAP for Option 2 and Option 3 for each year, compared to the baseline. Option 1 is not included in this table, as there are no estimated changes in emissions under Option 1.

Table 3-22 Annual Direct Increases in Methane, VOC and HAP Emissions, 2021 to 2030

	Option 2			Option 3 (Finalized)		
Year	**Methane (metric tons)**	**VOC (short tons)**	**HAP (short tons)**	**Methane (metric tons)**	**VOC (short tons)**	**HAP (short tons)**
2021	13,000	3,900	150	17,000	5,200	200
2022	16,000	4,900	190	21,000	6,500	250
2023	20,000	6,200	230	26,000	7,900	300
2024	25,000	7,500	280	31,000	9,500	360
2025	29,000	9,000	340	36,000	11,000	420
2026	35,000	11,000	400	42,000	13,000	490
2027	40,000	12,000	460	48,000	15,000	560
2028	46,000	14,000	530	55,000	17,000	630
2029	52,000	16,000	600	61,000	19,000	710
2030	58,000	18,000	670	68,000	21,000	790
Total	**330,000**	**100,000**	**3,800**	**410,000**	**120,000**	**4,700**

Note: Estimates may not sum due to independent rounding.

3.3.2 Methane Climate Effects and Valuation

The 2016 NSPS OOOOa was expected to result in climate-related benefits by reducing methane emissions. This action reduces the climate-related benefits associated with the emissions reductions from the 2016 NSPS OOOOa. We estimate the forgone climate benefits under the finalized and alternative options for the Technical Reconsideration using an interim measure of the domestic social cost of methane (SC-CH_4). See Section 2.3.3 for discussion of the climate effects associated with methane emissions and the valuation approach (*i.e.*, SC-CH_4) used in this RIA to estimate the impacts of forgone methane emissions reductions.

For the finalized Option 3 (presented in Table 2-4), the forgone methane reductions estimated for 2021 (0.43 million metric tons CO_2 Eq.) are equivalent to about 0.2 percent of the methane emissions for this sector reported in the GHGI in 2017 (about 197 million metric tons CO_2 Eq. are from petroleum and natural gas production and gas processing, transmission, and storage). Expected forgone emission reductions in 2030 (about 1.7 million metric tons CO_2 Eq.) are equivalent to around 0.9 percent of 2017 methane emissions.

As with the global SC-CH_4 estimates, the domestic SC-CH4 increases over time because future emissions are expected to produce greater marginal damages and because GDP generally grows over time and many damage categories are modeled in proportion to gross GDP. To monetize the forgone domestic climate benefits, the projected increases in methane emissions due to this regulatory action each year are multiplied by the SC-CH4 estimate for that year. See Table 2-15 in Section 2.3.3 for the average interim domestic SC-CH4 estimates developed under E.O. 13783 for emissions occurring in 2021 to 2030 and Section 2.3.3 and Appendix B for discussion of the limitations and uncertainties associated with the SC-CH_4 estimates. Appendix B also presents the forgone global climate benefits from the finalized option using global SC-CH_4 estimates based on both 3 and 7 percent discount rates.

Table 3-23 presents the monetized forgone domestic climate benefits for the finalized Option 3, both undiscounted and discounted. It shows the annual forgone benefits discounted back to 2020 and the PV and the EAV for 2021 to 2030 under each discount rate. Regardless of whether they are discounted, the annual forgone benefits increase between 2021 and 2030 as the number of sources impacted by this Technical Reconsideration grows over time.

Table 3-23 Estimated Forgone Domestic Climate Benefits of Option 3, 2021-2030 (millions, 2016$)

	Undiscounted		Discounted to 2020	
Year	**7 percent**	**3 Percent**	**7 percent**	**3 Percent**
2021	$1.0	$3.1	$0.9	$3.0
2022	$1.3	$4.0	$1.1	$3.7
2023	$1.6	$5.0	$1.3	$4.6
2024	$2.0	$6.1	$1.5	$5.5
2025	$2.5	$7.4	$1.8	$6.4
2026	$3.0	$8.9	$2.0	$7.4
2027	$3.5	$10	$2.2	$8.5
2028	$4.1	$12	$2.4	$9.5
2029	$4.8	$14	$2.6	$11
2030	$5.5	$16	$2.8	$12
PV			**$19**	**$71**
EAV			**$2.5**	**$8.1**

Note: Estimates may not sum due to independent rounding.

Table 3-24 shows the total forgone emissions reductions over the time horizon as well as the PV and EAV of the forgone domestic climate benefits using 3 percent and 7 percent discount rates. The forgone climate benefits are highly sensitive to the choice of the discount rate, as climate impacts accrue over long time horizons and models project increasing marginal damages associated with greenhouse gas emissions over time. The PV of forgone benefits under a 7 percent discount rate is about $19 million, with an EAV of about $2.5 million per year. The PV of forgone benefits under a 3 percent discount rate is $71 million, with an EAV of about $8.1 million per year.

Table 3-24 Total Estimated Forgone Domestic Climate Benefits (millions, 2016$)

	Option 1	Option 2	Option 3 (Finalized)
Total Increase in Emission, 2021-2030			
Forgone CH_4 reductions (metric tons)	0	330,000	410,000
Forgone CH_4 reductions (million metric tons of CO_2 Eq.)	0	8.3	10
Forgone Domestic Climate Benefits (millions 2016$)			
PV			
3% (average)	$0	$58	$71
7% (average)	$0	$15	$19
EAV			
3% (average)	$0	$6.6	$8.1
7% (average)	$0	$2.0	$2.5

The SC-CH_4 values are dollar-year and emissions-year specific. SC-CH_4 values represent only a partial accounting of climate impacts.

3.3.3 VOC as an Ozone Precursor

This final action is expected to result in forgone VOC emission reductions, which are a precursor to ozone. The impacts of forgone VOC emission reductions are not monetized in this RIA. See Section 2.3.4 for a qualitative discussion of the forgone ozone benefits associated with forgone VOC emission reductions. Sections 2.3.4.1, 2.3.4.2, and 2.3.4.3 discuss the health, vegetation, and climate effects of ozone, respectively.

3.3.4 VOC as a $PM_{2.5}$ Precursor

This final action is expected to result in forgone emission reductions of VOC, a precursor to $PM_{2.5}$, which is associated with impacts on human health. We have not quantified the forgone $PM_{2.5}$-related benefits due to this rule. See Sections 2.3.5.1, 2.3.5.2, and 2.3.5.3 for qualitative discussions of the health, welfare, and visibility effects, respectively, associated with $PM_{2.5}$.

3.3.5 Hazardous Air Pollutants (HAP)

This rulemaking is expected to result in forgone emission reductions of HAP, or air toxics. Available emissions data show that several different HAP are emitted from oil and natural gas operations, from equipment leaks, processing, compressing, transmission and distribution, and storage tanks. The main air toxics emitted by the source category include benzene, toluene, carbonyl sulfide, ethylbenzene, mixed xylenes, and n-hexane. This rule is anticipated to result in a total of 3,800 short tons of forgone HAP emissions reductions over 2021 to 2030, although it was not possible to estimate the changes in emissions of individual HAP due to data limitations.

Non-cancer health problems can result from chronic, subchronic, or acute inhalation exposure to air toxics, and include neurological, cardiovascular, liver, kidney, and respiratory effects as well as effects on the immune and reproductive systems. Section 2.3.6 discusses the EPA's assessment (*i.e.*, the National Air Toxics Assessment, or NATA) of the cancer and non-cancer health effects associated with exposure to air toxics. In the subsections within Section 2.3.6, we provide greater detail on the health effects associated with the main HAP of concern for the oil and natural gas sector: benzene, toluene, carbonyl sulfide, ethylbenzene, mixed xylenes, n-hexane, and several other air toxics.

3.4 Economic Impacts and Distributional Assessments

The EPA evaluated the following economic impact categories for this final Technical Reconsideration: energy market impacts, distributional impacts, small business impacts, and employment impacts. For much of this section, we direct readers to refer to the presentation of economic impacts in Chapter 2 (Section 2.5), as the methods used and several of the findings of the economic impact analysis for the Technical Reconsideration mirror those of the Policy Review.

3.4.1 Energy Markets Impacts

The RIA for the 2016 NSPS OOOOa concluded that the rule may have impacts on energy production and markets. Like the Policy Review, the Technical Reconsideration is expected to reduce compliance costs incurred by oil and natural gas sources. Thus, the finalized Option 3 for the Technical Reconsideration, like the Policy Review, is expected to reduce the energy market impacts associated with the 2016 NSPS OOOOa. See Section 2.4.1 for a summary of the energy market impact analysis conducted in the RIA for the 2016 NSPS OOOOa.

3.4.2 Distributional Impacts

The cost reductions and forgone health benefits associated with the Technical Reconsideration may be distributed unevenly across the U.S. population. The EPA did not conduct a quantitative assessment of distributional impacts for the Technical Reconsideration, but we provide a qualitative discussion of the types of distributional impacts that could result from this final action in the Policy Review. See Section 2.4.2 and subsection 2.4.2.1 for details.

3.4.3 Small Business Impacts

The Regulatory Flexibility Act (RFA; 5 U.S.C. §601 et seq.), as amended by the Small Business Regulatory Enforcement Fairness Act (Public Law No. 104121), provides that whenever an agency publishes a proposed rule, it must prepare and make available an initial regulatory flexibility analysis (IRFA), unless it certifies that the rule, if promulgated, will not have a significant economic impact on a substantial number of small entities (5 U.S.C. §605[b]). Small entities include small businesses, small organizations, and small governmental jurisdictions. An IRFA describes the economic impact of the rule on small entities and any significant alternatives to the rule that would accomplish the objectives of the rule while minimizing significant economic impacts on small entities.

An agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, has no net burden, or otherwise has a positive economic effect on small entities subject to the rule. Like the Policy Review described in Chapter 2 of this RIA, this reconsideration reduces the stringency of the requirements on a substantial portion of the sources affected by the 2016 NSPS OOOOa, and thus reduces the impacts of NSPS OOOOa. In addition, the three options being analyzed in this RIA would result in neutral or beneficial effects on the affected facilities. The Technical Reconsideration decreases the burden on affected sources through direct changes in the requirements, increased clarity of requirements (for example, through more robust definitions), finalizing alternative fugitive emissions standards, and the streamlining of recordkeeping and reporting requirements. We have therefore concluded that this final action will relieve regulatory burden on small entities affected by the reconsidered provisions.

3.4.4 Employment Impacts

In addition to addressing the costs and emissions reductions estimated for the final reconsideration, the EPA has analyzed the impacts of this rulemaking on employment.[99] Using detailed engineering information on labor requirements for the reconsidered provisions, we estimate partial employment impacts for affected entities in the oil and natural gas industry. These bottom-up, engineering-based estimates represent only one portion of potential employment impacts within the regulated industry and do not represent estimates of the *net* employment impacts of this rule. Due to data and methodology limitations, other potential employment impacts in the affected industry and impacts in related industries are not estimated. For an overview of the various ways that environmental regulation can affect employment, see Section 2.4.4 and subsection 2.4.4.1.

We estimate the impacts of the Technical Reconsideration on the labor required to comply with the 2016 NSPS OOOOa. We estimate the incremental change due to the reconsideration, as compared to the baseline, in labor required to satisfy environmental mitigation requirements as well as reporting and recordkeeping requirements. Most of the estimated change in labor requirements relative to the baseline come from the changes to the fugitive emissions program.

The labor estimates include labor associated with company-level activities and activities at field sites. Company-level activities included one-time "up-front" activities such as planning the company's fugitive emissions program and annual requirements such as reporting and recordkeeping. Field-level activities included inspection and repair of leaks. The labor information is based upon the cost analysis presented in the TSD that supports this rule.

Table 3-25 presents the incremental change in labor required to comply with the NSPS due to the final amendments at the facility level in hours per facility per year. The change in estimates for each of the facility types reflect the following changes from the baseline:

[99] The employment analysis in this RIA is part of the EPA's ongoing effort to "conduct continuing evaluations of potential loss or shifts of employment which may result from the administration or enforcement of [the Act]" pursuant to CAA section 321(a).

- **Well sites:** change from semiannual fugitives monitoring requirements to streamlined requirements for semiannual monitoring and alternative fugitive emissions standards in relevant areas.[100]

- **Well sites (low production):** change from semiannual fugitives monitoring requirements to no monitoring requirements.

- **Gathering and Boosting Stations:** change from quarterly fugitives monitoring requirements to streamlined requirements for quarterly monitoring.[101]

- **Certifications:** change from requirement that professional engineer perform certification to an in-house engineer performing certifications.

Table 3-25 Facility-level Changes in Labor Required to Comply with NSPS OOOOa (hours per facility per year)

	Upfront Annual Labor Estimate (hours per facility per year)			Annual Labor Estimate (hours per facility per year)		
Facility	**Baseline**	**Recon-sideration**	**Incremental Change**	**Baseline**	**Recon-sideration**	**Incremental Change**
Well Sites						
Annual monitoring	8.5	2	-6.5	12.5	10	-2.5
Semiannual monitoring	8.5	2	-6.5	18.6	14.6	-4
Well Sites (Low Production)						
Annual monitoring	8.5	0	-8.5	10.3	0	-10.3
Semiannual monitoring	8.5	0	-8.5	14.2	0	-14.2
Compressor Stations						
Gathering and Boosting	10.6	4.1	-6.5	65.7	37.5	-28.2
Certifications	6	5	-1	0	0	0

Tables 3-26 and 3-27 present estimates of the decrease in upfront labor requirements for compliance requirements for non-low production well sites, low production well sites, gathering and boosting stations, and certifications, respectively. The estimates are presented in terms of FTE in these tables; in this analysis we assume one FTE equals 2,080 hours (the product of 40

[100] Since the 2018 Amendment package reduced monitoring frequency at NSPS-affected well sites on the Alaska North Slope from semiannual to annual frequency, Alaska well sites change from annual fugitives monitoring requirements to streamlined annual requirements.

[101] EPA is reducing the required monitoring frequency at NSPS-affected gathering and boosting stations from quarterly to annual for those on the Alaska North Slope. We are unable to quantify the potential compliance-related labor impacts associated with this provision.

hours per week over 52 weeks). Reductions in labor increase from 2021 to 2030 as the number of sites affected by the Technical Reconsideration accumulates.

Table 3-26 Estimates of the Decrease in Upfront Labor Required (in FTE), 2021-2030

Year	Well Sites	Well Sites (Low Production)	Gathering and Boosting Stations	Certifications	Total
2021	33	7.3	0.66	0.76	42
2022	35	7.6	0.66	0.79	44
2023	55	32	1.3	0.80	90
2024	46	19	1.3	0.81	67
2025	49	23	1.3	0.82	74
2026	53	28	1.3	0.82	83
2027	54	29	1.3	0.83	85
2028	55	30	1.3	0.83	87
2029	56	31	1.3	0.83	89
2030	57	32	1.3	0.83	91

Note: Full-time equivalents (FTE) are estimated by first multiplying the projected number of affected units by the per unit labor requirements and then multiplying by 2,080 (40 hours multiplied by 52 weeks). Estimates may not sum due to independent rounding.

Table 3-27 Estimates of the Decrease in Annual Labor Required (in FTE), 2021-2030

Year	Well Sites	Well Sites (Low Production)	Gathering and Boosting Stations	Certifications	Total
2021	340	120	20	0	490
2022	390	160	23	0	570
2023	440	190	26	0	660
2024	490	230	29	0	740
2025	530	270	32	0	830
2026	570	310	34	0	920
2027	610	360	37	0	1,000
2028	650	400	40	0	1,100
2029	690	450	43	0	1,200
2030	720	500	46	0	1,300

Note: Full-time equivalents (FTE) are estimated by first multiplying the projected number of affected units by the per unit labor requirements and then multiplying by 2,080 (40 hours multiplied by 52 weeks). Estimates may not sum due to independent rounding.

The total incremental reductions in up-front labor requirements for the affected industry to comply with the final reconsideration are estimated to increase from 42 FTE in 2021 to 91 FTE in 2030. The total incremental reductions in annual labor requirements for the affected industry to comply with the final reconsideration are estimated to increase from about 490 FTE in 2021 to 1,300 FTE in 2030.

We note that this type of FTE estimate cannot be used to identify the specific number of employees involved or whether new jobs are created for new employees, versus displacing jobs from other sectors of the economy. As stated earlier, this rule is expected to result in little change in oil and natural gas exploration and production and is not expected to result in significant reductions to the labor dedicated to these tasks. For impacted oil and natural gas entities affected, some reductions in labor from 2016 NSPS OOOOa-related requirements may be expected under the final reconsideration. We did not estimate any potential impacts on labor outside of the affected sector. For example, no estimates of labor requirements for manufacturing pollution control equipment, or for producing the materials used in that equipment, are provided as the EPA did not have the necessary information.

3.5 Comparison of Benefits and Costs

3.5.1 Comparison of Benefits and Costs

In this section, we present a comparison of the benefits and costs of this final Technical Reconsideration across regulatory options. We refer to the cost reductions as the “benefits” of this final action and the forgone benefits as the “costs” of this final action. The net benefits are the benefits (cost reductions) minus the costs (forgone benefits). All costs and benefits in this RIA are estimated relative to the baseline. The benefits, costs, and net benefits shown in this section are presented in PV terms for 2021 to 2030 discounted to 2020 using 7 percent and 3 percent discount rates, along with the associated EAVs.

Table 3-28 shows the estimated benefits, costs and net benefits for Option 1, the most stringent option. In this option, we estimate the impact of streamlined fugitive emissions monitoring reporting and recordkeeping, certifying several state fugitive emissions monitoring programs as alternative fugitive emissions standards, and in-house certifications. As there are no projected changes in emissions under this unselected option, there are no costs (forgone benefits). For option 1, at a 7 percent discount rate, the PV of net benefits is estimated to be $350 million with an EAV of $46 million. At a 3 percent discount rate, the PV of net benefits is estimated to be $440 million with an EAV of $50 million.

Table 3-28 Present Value (PV) and Equivalent Annualized Value (EAV) of Forgone Monetized Benefits, Cost Reductions, and Net Benefits for Unselected Option 1 from 2021 to 2030 (millions, 2016$)

	7%		3%	
	PV	**EAV**	**PV**	**EAV**
Benefits (Total Cost Reductions)	$350	$46	$440	$50
Cost Reductions	$350	$46	$440	$50
Forgone Value of Product Recovery	$0	$0	$0	$0
Costs (Forgone Domestic Climate Benefits)	$0	$0	$0	$0
Net Benefits	$350	$46	$440	$50

Note: Estimates may not sum due to independent rounding.

Table 3-29 shows the estimated benefits, costs and net benefits for Option 2. Option 2 results in net benefits greater than those of Option 1, but less than those of Option 3. In this option, we estimate the impact of removing of the fugitive emissions monitoring requirement for low production well sites, streamlining fugitive emissions monitoring reporting and recordkeeping at non-low production well sites and gathering and boosting stations, certifying several state fugitive emissions monitoring programs as alternative fugitive emissions standards, and allowing in-house engineering certifications for closed vent systems and infeasibility . For the finalized Option 3, at a 7 percent discount rate, the PV of net benefits is estimated to be $670 million with an EAV of $89 million. At a 3 percent discount rate, the PV of net benefits is estimated to be $810 million with an EAV of $92 million.

Table 3-29 Present Value (PV) and Equivalent Annualized Value (EAV) of Forgone Monetized Benefits, Cost Reductions, and Net Benefits for Unselected Option 2 from 2021 to 2030 (millions, 2016$)

	7%		3%	
	PV	**EAV**	**PV**	**EAV**
Benefits (Total Cost Reductions)	$680	$91	$860	$98
Cost Reductions	$720	$96	$910	$100
Forgone Value of Product Recovery	$36	$4.8	$47	$5.3
Costs (Forgone Domestic Climate Benefits)	$15	$2.0	$58	$6.6
Net Benefits	$670	$89	$810	$92

Note: Estimates may not sum due to independent rounding.

Table 3-30 shows the estimated benefits, costs and net benefits for the finalized Option 3. Option 3 is estimated to have the greatest cost reductions, forgone benefits, and net benefits of the three options analyzed. The finalized Option 3 is identical to Option 2 with the exception that fugitive emissions monitoring and repair frequency at gathering and boosting stations is reduced from quarterly to semiannual. For Option 3, the PV of net benefits is estimated to be $730 million with an EAV of $97 million at a 7 percent discount rate. The PV of net benefits is estimated to be $880 million with an EAV of $100 million at a 3 percent discount rate.

Table 3-30 Present Value (PV) and Equivalent Annualized Value (EAV) of Forgone Monetized Benefits, Cost Reductions, and Net Benefits for Finalized Option 3 from 2021 to 2030 (millions, 2016$)

	7%		3%	
	PV	**EAV**	**PV**	**EAV**
Benefits (Total Cost Reductions)	$750	$100	$950	$110
Cost Reductions	$800	$110	$1,000	$110
Forgone Value of Product Recovery	$44	$5.9	$57	$6.5
Costs (Forgone Domestic Climate Benefits)[1]	$19	$2.5	$71	$8.1
Net Benefits[2]	$730	$97	$880	$100

Note: Estimates may not sum due to independent rounding.
[1] The forgone benefits estimates are calculated using estimates of the social cost of methane (SC-CH_4). SC-CH_4 values represent only a partial accounting of domestic climate impacts from methane emissions. See Section 2.3 for more discussion.

Table 3-31 provides a summary of the forgone emissions reductions for each regulatory option. There are no changes in emissions estimated as a result of Option 1. Option 3 results in the greatest forgone emissions reductions compared to the baseline.

Table 3-31 Summary of Total Forgone Emissions Reductions across Options, 2021 to 2030

Pollutant	**Option 1**	**Option 2**	**Option 3 (Finalized)**
Methane (short tons)	0	370,000	450,000
VOC (short tons)	0	100,000	120,000
HAP (short tons)	0	3,800	4,700
Methane (metric tons)	0	330,000	410,000
Methane (million metric tons CO_2 Eq.)	0	8.3	10

3.5.2 Uncertainties and Limitations

There are several sources of uncertainty regarding the forgone emissions reductions, forgone benefits, and cost reductions estimated in this RIA for the Technical Reconsideration. We summarize the key uncertainties and limitations here:

Source-level compliance costs and emissions impacts: As discussed in Section 3.2.2, the first step in the compliance cost analysis is the development of per-facility national-average representative costs and emissions impacts using a model plant approach. The model plants are designed based upon the best information available to the Agency at the time of the rulemaking. By emphasizing facility averages, geographic variability and heterogeneity across producers in the industry may be masked, and regulatory impacts at the facility-level may vary from the model plant averages.

Projection methods and assumptions: As discussed in Section 3.2.3, the second step in estimating national impacts is the projection of affected facilities. Uncertainty in the projections informing this chapter include uncertainties such as: 1) choice of projection method; 2) data sources and drivers; 3) limited information about rate of modification and turnover of sources; 4) behavioral responses to regulation; and 5) unforeseen changes in industry and economic shocks.

Over time, more facilities are established or modified in each year, and to the extent the facilities remain in operation in future years, the total number of facilities subject to NSPS OOOOa accumulates. The impacts of this rule are highly influenced by projections and growth rates for drilling activity in the AEO2020. To the extent actual drilling activities diverge from the AEO projections, the regulatory impacts will diverge from those shown in this RIA. The projection of low production well sites also relies on a series of assumptions that introduce substantial uncertainties, which are discussed in Section 3.2.3. These uncertainties include the assumption that past production levels can be used to predict future production and the assumption that there are two wells per site with identical production profiles. The dataset used to estimate the transition proportions may also exclude wells that were shut-in since completion, which would lead to over-estimates of compliance cost and emissions impacts.

Additionally, some emissions reducing technologies have become common industry practice under the oil and natural gas sector NSPS. However, by removing regulatory requirements, there may be incentives to reduce use of these technologies, introducing uncertainties in how regulated entities may respond both directly and indirectly to the removal of NSPS requirements.

The projections do not account for potential changes in technological progress in the oil and gas industry. Additionally, unforeseen economic shocks may affect the rule's impacts, such as unexpected economic growth or recessions. For example, the projections in this RIA do not account for potential effects of economic shocks arising from the coronavirus pandemic.

Years of analysis: The years of analysis are 2021, to represent the first-year facilities are affected by this Technical Reconsideration, through 2030, to represent impacts of the rule over a longer period. While it is desirable to analyze impacts beyond 2030, the EPA has chosen not to do so largely because of the limited information available on the turnover rate of emissions sources and controls. Extending the analysis beyond 2030 would introduce increasing uncertainties in projected impacts of the final reconsideration.

Fugitive emissions monitoring requirements and alternative fugitive emissions standards: The EPA reviewed state regulations and permitting requirements. Emissions reductions from applicable facilities under state requirements that are considered equivalent to the NSPS are included in the baseline for this analysis. We also estimate cost reductions from deeming programs in six states as equivalent to NSPS OOOOa, which reduces reporting and recordkeeping burden for sources regulated under those programs. We made simplifying assumptions to estimate the cost reductions associated with the reduced recordkeeping for affected facilities regulated under the state programs deemed equivalent to NSPS OOOOa.[102] Due to uncertainty regarding these assumptions, there is uncertainty in the assumed cost reductions from reduced federal reporting and recordkeeping requirements for facilities under alternative fugitive emissions standards.

Wellhead natural gas prices used to estimate forgone revenues from natural gas recovery: The cost reductions estimated in this RIA include the forgone revenue associated with the decrease in natural gas recovery resulting from forgone emissions reductions. As a result, the forgone revenues in the cost reduction estimates depend on the price of natural gas. The natural gas prices used in this analysis are from the projection of the Henry Hub price in the AEO2020. As with any modeling of prices, many assumptions regarding future economic activity and several of the data sources used to inform the AEO in projecting natural gas prices are subject to uncertainty. To the extent actual natural gas prices diverge from the AEO projections, the impacts estimated in this RIA will diverge from actual impacts.

[102] For example, we assume that operators in equivalent states will continue to incur company-level reporting and recordkeeping costs related to reading the rule, developing a fugitive emissions monitoring plan, and establishing and maintaining a database. If an affected entity operates solely within an equivalent area, the entity would not incur any of these costs due to federal requirements, and thus cost reductions for such an entity's facilities would be understated in the impact estimates in this RIA.

Monetized forgone methane-related climate benefits: The EPA considered the uncertainty associated with the social cost of methane (SC-CH_4) estimates, which were used to estimate the forgone domestic benefits associated with the increase in methane emissions projected under the regulatory options examined in this RIA. Several sources of uncertainty cannot be quantified. Section 2.3.3 and Appendix B provide detailed discussions of the ways in which the modeling underlying the development of the SC-CH_4 estimates used in this analysis addresses quantifiable sources of uncertainty, and presents a sensitivity analysis to show how the choice of discount rate affects the SC-CH_4 estimates over long time horizons.

Non-monetized forgone benefits: Several categories of forgone health, welfare, and climate benefits are not quantified and monetized in this RIA. These unquantified forgone benefits are associated with increased emissions of methane, VOCs, and HAP. Section 3.3 describes the unquantified forgone benefits associated with these emissions.

3.6 References

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4 ANALYSIS OF THE COMBINED REGULATORY IMPACTS OF THE POLICY REVIEW AND TECHNICAL RECONSIDERATION

4.1 Introduction

To better inform the public on the aggregate regulatory impacts of the two final actions discussed in this document, this chapter presents the analysis of the combined regulatory impacts of the two actions. The combined impacts are projected relative to a baseline representing the regulatory landscape in the absence of either action, *i.e.*, the same baseline used in the Policy Review analysis.

As a reminder, Chapter 2 in this document presents the regulatory impacts of the final amendments referred to in this document as the Policy Review, while Chapter 3 presents the regulatory impacts of the final amendments which we refer to in this document at the Technical Reconsideration. The Policy Review removes sources in the transmission and storage segment from the source category, rescinds the NSPS (including both the volatile organic compounds and methane requirements) applicable to those sources, and rescinds the methane-specific requirements of the NSPS applicable to sources in the production and processing segments. The Technical Reconsideration finalizes amendments to the 2016 OOOOa NSPS fugitive emissions requirements, well site pneumatic pump standards, requirements for certification of closed vent systems (CVS) by a professional engineer, and the provisions which outline the use of alternative fugitive emissions standards for several state programs.

To avoid redundant descriptions of the methods, assumptions, and data used to estimate the impacts presented in this chapter, we refer readers back to Chapters 2 and 3 and focus this chapter on presenting the results of the analysis for the combined final actions. Readers can also find tables with more detailed results for the individual actions in Chapters 2 and 3.

4.2 Compliance Cost Reductions and Forgone emissions reductions

4.2.1 Pollution Controls and Emissions Points Assessed in this RIA

The analysis presented in this chapter reflects the emissions points and controls assessed in the preceding chapters. This includes fugitive emissions monitoring requirements at well sites and gathering and boosting stations (Technical Reconsideration), and transmission and storage compressor stations (Policy Review); replacement of high-bleed pneumatic controllers with low-bleed controllers in the transmission and storage segment (Policy Review); rod-packing replacement at reciprocating compressors in the transmission and storage segment (Policy Review); and certification of closed vent systems or technical infeasibility at storage vessels, compressors, and pneumatic pumps (Technical Reconsideration). See Sections 2.2.1 and 3.2.1 for more details.

4.2.2 Projection of Affected Facilities

The projected affected facility counts for this analysis are identical to the projected counts used in the analyses underlying the preceding chapters. See Sections 2.2.2 and 3.2.2 and the associated tables for details.

4.2.3 Forgone Emissions Reductions

Table 4-1 presents the projected forgone emissions reductions associated with the combined rulemakings compared to the baseline (i.e., where neither rule has been promulgated). Increases in emissions are estimated by multiplying the source-level increases in emissions from the updated baseline by the corresponding projected number of affected facilities. The projected forgone emissions reductions in Table 4-1 are equivalent to the sum of the forgone emissions reductions in Table 2-4 and Table 3-6. As noted in previous chapters of this document, some provisions included in the Policy Review and Technical Reconsideration are not analyzed because we either do not have the data to do so or because the provision is not expected to result in cost reductions or emission changes.

Table 4-1 Projected Forgone Emissions Reductions from the Combined Policy Review and Technical Reconsideration, 2021 to 2030

	Emission Changes			
Year	**Methane (short tons)**	**VOC (short tons)**	**HAP (short tons)**	**Methane (metric tons CO_2 Eq.)**
2021	41,000	5,800	220	930,000
2022	49,000	7,200	270	1,100,000
2023	58,000	8,800	320	1,300,000
2024	68,000	10,000	390	1,500,000
2025	78,000	12,000	450	1,800,000
2026	88,000	14,000	520	2,000,000
2027	99,000	16,000	600	2,200,000
2028	110,000	18,000	670	2,500,000
2029	120,000	20,000	750	2,700,000
2030	130,000	23,000	840	3,000,000
Total	850,000	140,000	5,000	19,000,000

Note: Estimates may not sum due to independent rounding.

4.2.4 Forgone Product Recovery

Some emissions control requirements in the baseline capture methane and VOC emissions that would otherwise be emitted in absence of such requirements (*i.e.*, the fugitive emissions monitoring program requirements), and we assume that a large proportion of these averted methane emissions in the baseline can be directed into natural gas production streams and sold. When including the decrease in natural gas recovery in the cost reductions analysis, we use the projections of natural gas prices provided in the EIA's AEO2020 reference case. See Section 2.2.5 for details on natural gas price assumptions.

Table 4-2 summarizes the projected decrease in natural gas recovery and the associated forgone revenues included in the cost reductions calculations for the combined Policy Review and Technical Reconsideration. The projected decrease in natural gas recovery and the associated forgone revenue reductions in each row of Table 4-2 is equivalent to the sum of the values in the corresponding rows from Table 2-5 and Table 3-7.

Table 4-2 Projected Decrease in Natural Gas Recovery from the Combined Policy Review and Technical Reconsideration, 2021 to 2030

Year	Decrease in Gas Recovery (Mcf)	Forgone Revenue (millions 2016$)
2021	2.4	$4.9
2022	2.9	$5.9
2023	3.4	$7.1
2024	3.9	$8.6
2025	4.5	$11
2026	5.1	$13
2027	5.7	$16
2028	6.4	$18
2029	7.0	$20
2030	7.7	$21

4.2.5 Compliance Cost Reductions

Table 4-3 summarizes the projected cost reductions and forgone revenue from product recovery for the combined Policy Review and Technical Reconsideration. Annualized cost reductions are estimated by applying a capital recovery factor, based on a 7 percent interest rate and the assumed equipment lifetime, to capital cost reductions. The projected cost reductions and forgone revenue in Table 4-3 are equivalent to the sum of projected cost reductions and forgone revenues in Table 2-6 and Table 3-8.

Table 4-3 Estimated Cost Reductions from the Combined Policy Review and Technical Reconsideration, 2021 to 2030 (millions 2016$)

Year	Compliance Cost Reductions				
	Capital Cost Reductions[1]	Operating and Maintenance Cost Reductions	Annualized Cost Reductions (w/o Forgone Revenue)[2]	Forgone Revenue from Product Recovery	Annualized Cost Reductions (with Forgone Revenue)
2021	$8.8	$56	$65	$4.9	$61
2022	$9.1	$67	$78	$5.9	$72
2023	$18	$79	$92	$7.1	$85
2024	$14	$93	$110	$8.6	$98
2025	$15	$110	$120	$11	$110
2026	$17	$120	$140	$13	$120
2027	$18	$140	$150	$16	$140
2028	$18	$150	$170	$18	$150
2029	$18	$170	$190	$20	$170
2030	$19	$180	$210	$21	$190

Note: Estimates may not sum due to independent rounding.
[1] The capital cost reductions include the planning cost reductions for newly affected sources for fugitive emissions monitoring and capital cost reductions for newly affected controllers and compressors, as well as the cost reductions for sources that would renew survey monitoring plans and purchase new capital at the end of its useful life.
[2] These cost reductions include the capital cost reductions annualized over the requisite equipment lifetimes at an interest rate of 7 percent, plus the annual operating and maintenance cost reductions for every year, plus the cost reductions from streamlined recordkeeping and reporting.

Table 4-4 illustrates the sensitivity of the estimated cost reductions to the interest rate used to annualize capital costs. We present cost reductions using interest rates of 7 percent and 3 percent. The results in Table 4-4 are equivalent to the sum of projected cost reductions and forgone revenue in Table 2-7 and Table 3-9.

Table 4-4 Estimated Cost Reductions from the Combined Policy Review and Technical Reconsideration, 2021 to 2030 (millions 2016$)

	7 percent			3 percent		
Year	Annualized Cost Reductions (w/o Forgone Revenue)	Forgone Revenue from Product Recovery	Annualized Cost Reductions (with Forgone Revenue)	Annualized Cost Reductions (w/o Forgone Revenue)	Forgone Revenue from Product Recovery	Annualized Cost Reductions (with Forgone Revenue)
2021	$65	$4.9	$61	$64	$4.9	$60
2022	$78	$5.9	$72	$77	$5.9	$71
2023	$92	$7.1	$85	$91	$7.1	$84
2024	$110	$8.6	$98	$110	$8.6	$97
2025	$120	$11	$110	$120	$11	$110
2026	$140	$13	$120	$140	$13	$120
2027	$150	$16	$140	$150	$16	$140
2028	$170	$18	$150	$170	$18	$150
2029	$190	$20	$170	$190	$20	$170
2030	$210	$21	$190	$200	$21	$180

Note: Estimates may not sum due to independent rounding.

4.2.6 Present Value and Equivalent Annualized Value of Cost Reductions

This section presents the cost reductions for the combined Policy Review and Technical Reconsideration in a present value (PV) framework. Table 4-5 shows the unannualized, undiscounted stream of cost reductions for each year from 2021 to 2030. Table 4-6 then shows the stream of discounted cost reductions for each year from 2021 to 2030. The stream of estimated cost reductions for each year from 2021 through 2030 is discounted to 2020 using 7 and 3 percent discount rates and summed to estimate the PV of the cost reductions from 2021 to 2030. Table 4-6 also shows the equivalent annualized value (EAV) associated with the PV of the cost reductions. The EAV is a single annual value which, when discounted and summed across years in the analysis time frame, equals the PV of the original stream of values. In other words, the sum of the EAV across years in PV terms yields the PV of the (generally) time-varying stream of values.

Table 4-5 Undiscounted Projected Compliance Cost Reductions from the Combined Policy Review and Technical Reconsideration, 2021-2030 (millions 2016$)

Year	Capital Cost Reductions	Annual Operating Cost Reductions	Total Cost Reductions (w/o Forgone Revenue)	Forgone Revenue from Product Recovery	Total Cost Reductions (with Forgone Revenue)
2021	$8.8	$56	$65	$4.9	$60
2022	$9.1	$67	$76	$5.9	$70
2023	$18	$79	$98	$7.1	$90
2024	$14	$93	$110	$8.6	$98
2025	$15	$110	$120	$11	$110
2026	$17	$120	$140	$13	$120
2027	$18	$140	$150	$16	$140
2028	$18	$150	$170	$18	$150
2029	$18	$170	$180	$20	$160
2030	$19	$180	$200	$21	$180

Note: Estimates may not sum due to independent rounding.

Table 4-6 Discounted Cost Reductions from the Combined Policy Review and Technical Reconsideration, using 7 and 3 Percent Discount Rates (millions 2016$)[1]

	7 Percent			3 Percent		
Year	Total Annual Cost Reductions (w/o Forgone Revenue)	Forgone Revenue from Product Recovery	Total Cost Reductions (with Forgone Revenue)	Total Annual Cost Reductions (w/o Forgone Revenue)	Forgone Revenue from Product Recovery	Total Cost Reductions (with Forgone Revenue)
2021	$60	$4.6	$56	$63	$4.8	$58
2022	$67	$5.2	$62	$72	$5.6	$66
2023	$80	$5.8	$74	$89	$6.5	$83
2024	$82	$6.6	$75	$95	$7.6	$87
2025	$87	$7.6	$79	$100	$9.2	$96
2026	$92	$8.8	$83	$120	$11	$100
2027	$95	$9.7	$86	$120	$13	$110
2028	$98	$10	$88	$130	$14	$120
2029	$100	$11	$90	$140	$15	$130
2030	$100	$11	$91	$150	$16	$130
PV	**$860**	**$80**	**$780**	**$1,100**	**$100**	**$990**
EAV	**$110**	**$11**	**$100**	**$120**	**$12**	**$110**

Note: Estimates may not sum due to independent rounding.
[1] Cost reductions and forgone revenue in each year are discounted to 2020.

The Policy Review and Technical Reconsideration are considered deregulatory actions under E.O. 13771, Reducing Regulation and Controlling Regulatory Costs. The PV of the combined projected cost reductions from the two final rules calculated in accordance with E.O. 13771 accounting standards are $1.1 billion over an infinite time horizon (in 2016$, discounted to 2016 at 7 percent). The EAV of the cost reductions over an infinite time horizon are $79 million per year (in 2016$, discounted to 2016 at 7 percent).

4.3 Forgone Benefits

For the 2012 NSPS OOOO and 2016 NSPS OOOOa, the EPA projected climate and ozone benefits from methane reductions, ozone and fine particulate matter ($PM_{2.5}$) health benefits from VOC reductions, and health benefits from ancillary HAP emissions reduction. Compliance with these standards was projected to yield benefits due to reductions in methane, VOC, and HAP emissions.

Under the Policy Review and Technical Reconsideration, the EPA expects that the forgone VOC emission reductions will worsen air quality and adversely affect health and welfare due to the contribution of VOCs to ozone, $PM_{2.5}$, and HAP, but we are unable to quantify these impacts at this time. This omission does not imply that these forgone benefits do not exist.

We estimate the forgone climate benefits under the combined Policy Review and Technical Reconsideration using an interim measure of the domestic social cost of methane (SC-CH_4). The SC-CH_4 is an estimate of the monetary value of impacts associated with marginal changes in CH_4 emissions in a given year. It includes a wide range of anticipated climate impacts, including those on agricultural productivity and human health, property damage due to increased flood risk, and energy system costs, (*e.g.*, reduced costs for heating and increased costs for air conditioning). It is typically used to assess the avoided damages as a result of regulatory actions (*i.e.*, the benefits associated with incremental reductions in cumulative CH_4 emissions due to regulation). The SC-CH_4 estimates used in this analysis focus on the direct impacts of climate change that are anticipated to occur within U.S. borders. See Section 2.2.3 and Appendix B for more detailed discussion of the SC-CH_4.

Table 4-7 presents the projected monetized forgone domestic climate benefits associated with the combined Policy Review and Technical Reconsideration. The results in Table 4-7 are equal to the sum of the projected monetized forgone domestic climate benefits presented in Table 2-16 and Table 3-23.

Table 4-7 Projected Forgone Domestic Climate Benefits Reductions from the Combined Policy Review and Technical Reconsideration, 2021-2030 (millions, 2016$)

	Undiscounted		Discounted back to 2020	
Year	**7 percent**	**3 Percent**	**7 percent**	**3 Percent**
2021	$2.1	$6.7	$2.0	$6.5
2022	$2.7	$8.4	$2.4	$7.9
2023	$3.3	$10	$2.7	$9.3
2024	$4.0	$12	$3.1	$11
2025	$4.8	$14	$3.4	$12
2026	$5.6	$17	$3.8	$14
2027	$6.5	$19	$4.1	$16
2028	$7.5	$22	$4.4	$17
2029	$8.6	$25	$4.7	$19
2030	$9.8	$28	$5.0	$21
PV			**$35**	**$130**
EAV			**$4.7**	**$15**

Note: Estimates may not sum due to independent rounding.

4.4 Economic Impacts and Distributional Assessments

As in the preceding chapters, we discuss but do not quantify energy market, distributional, or small business impacts associated with the combined Policy Review and Technical Reconsideration. We expect that the combined final actions will reduce the energy market impacts associated with the 2016 NSPS OOOOa, may have unevenly distributed impacts across the U.S. population, and will have neutral or beneficial impacts on small businesses (*i.e.*, no SISNOSE). See Sections 2.4.1, 2.4.2, and 2.4.3 for more detailed discussion.

We estimated partial employment impacts for entities in the oil and natural gas industry projected to be affected by the Policy Review and Technical Reconsideration. Table 4-8 presents estimates of the decrease in upfront and annual labor requirements associated with compliance activities resulting from the combined final actions. In total, we estimate decreases in compliance-related labor ranging from 550 full-time equivalents (FTE) in 2021 to 1,400 FTE in 2030, mostly driven by decreases in annual labor requirements. We did not estimate changes in labor in the oil and natural gas sector beyond the labor related to the compliance activities directly affected by these actions, nor did we estimate changes in labor in other sectors that may result from these final actions. See Section 2.4.4 for a broader discussion of the labor impacts, including a qualitative overview of regulatory impacts on employment.

Table 4-8 Estimates of the Decrease in Labor Required for Compliance (in FTEs), 2021–2030

Year	Upfront	Annual	Total
2021	43	520	560
2022	45	610	650
2023	92	700	790
2024	70	790	860
2025	76	880	960
2026	86	970	1,100
2027	87	1,100	1,100
2028	90	1,200	1,200
2029	92	1,200	1,300
2030	94	1,300	1,400

Note: Estimates may not sum due to independent rounding.

4.5 Comparison of Benefits and Costs

4.5.1 Comparison of Benefits and Costs

In this section, we present a comparison of the benefits and costs of the combined Policy Review and Technical Reconsideration (Table 4-9). Here, we refer to the cost reductions as the "benefits" of this combined actions and the forgone benefits as the "costs" of the combined actions. The net benefits are the benefits (cost reductions) minus the costs (forgone benefits). All costs and benefits in this RIA are estimated relative to a baseline in which neither action has been implemented. The benefits, costs, and net benefits shown in this section are presented in PV terms for 2021 to 2030 discounted to 2020 using 7 percent and 3 percent discount rates, along with the associated EAVs. Table 4-10 provides a summary of the projected forgone emissions reductions for this action. Both Table 4-9 and Table 4-10 are equivalent to the sum of the values in their respective tables in Sections 2.5.1 and 3.5.1.

Table 4-9 Present Value (PV) and Equivalent Annualized Value (EAV) of Forgone Monetized Benefits, Cost Reductions, and Net Benefits from the Combined Policy Review and Technical Reconsideration, 2021 through 2030 (millions, 2016$)

	7 percent		3 percent	
	PV	EAV	PV	EAV
Benefits (Total Cost Reductions)	$780	$100	$990	$110
Cost Reductions	$860	$110	$1,100	$120
Forgone Value of Product Recovery	$80	$11	$100	$12
Costs (Forgone Domestic Climate Benefits)[1]	$35	$4.7	$130	$15
Net Benefits	$750	$99	$850	$97

Note: Estimates may not sum due to independent rounding.
[1] The forgone benefits estimates are calculated using estimates of the social cost of methane (SC-CH_4). SC-CH_4 values represent only a partial accounting of domestic climate impacts from methane emissions.

Table 4-10 Summary of Forgone Emission Reductions from the Combined Policy Review and Technical Reconsideration, 2021 through 2030

Pollutant	Policy Review
Methane (short tons)	850,000
VOC (short tons)	140,000
HAP (short tons)	5,000
Methane (metric tons)	770,000
Methane (million metric tons CO_2 Eq.)	19

4.5.2 Uncertainties and Limitations

The results of the combined analysis presented in this Chapter are subject to the uncertainties discussed in Sections 2.5.2 and 3.5.2. While the reader is referred to those sections for more detail, we list the main sources of uncertainties here:

- Source-level compliance costs and emissions impacts
- Projection methods and assumptions
- Years of analysis
- State regulations in the baselines for this analysis
- Wellhead natural gas prices used to estimate forgone revenues from natural gas recovery
- Monetized forgone methane-related climate benefits
- Non-monetized forgone benefits

APPENDIX A ADDITIONAL INFORMATION ON ACTIVITY COUNT PROJECTIONS

A.1 Updated Baseline

The baseline used in this analysis represents our estimate of the present and future state of the oil and natural gas industry as of this final action. This includes an estimate of the number of sources that are subject to the 2016 NSPS OOOOa using the same methods as were used in the 2016 NSPS analysis. A description of these methods is in the 2016 NSPS Final TSD and 2016 RIA. Where possible, we updated the information used, including sources of information, as described below. For well sites, we used a base year, in this case 2014, estimate of the number of oil and natural gas wells, along with a year-by-year rate of change in the number of new oil and natural gas wells, to project the number of affected oil and natural gas wells through 2030. For gathering and boosting stations and transmission and storage facilities, we estimated an average number of new facilities per year.

A.2 Data Sources

Data from oil and natural gas technical documents and inventories, including previous TSDs for oil and gas actions, were used to estimate the number of new sources for each of the oil and natural gas segments. Information from the DrillingInfo database and the GHGI were updated from the 2016 NSPS OOOOa analysis. DrillingInfo was used to estimate the number of new well sites in 2014, and AEO2020 was used to project the number of new well sites through 2030. The GHGI was used to update the equipment counts for well sites and gathering and boosting stations, while equipment counts for the transmission and storage compressor stations were not updated for the model plants. We used the GHGI to estimate the number of new gathering and boosting, transmission, and storage compressor stations, and other equipment in the transmission and storage segment, such as reciprocating compressors and pneumatic controllers. Finally, we relied on data submitted in compliance reports for the 2016 NSPS OOOOa to inform our projections for a few sources, such as storage vessels, pneumatic pumps, and centrifugal compressors.

A.3 Number of Well Sites

The DrillingInfo database provided the information on the total number of oil and natural gas wells completed or recompleted in 2014 in the U.S. The base year of 2014 was chosen because 2014 predated the proposal for the 2016 NSPS OOOOa, and therefore activity in that year was not affected by those requirements. The DrillingInfo data includes information on GOR, location, and production. The EPA used this data to calculate the number of affected sources for each sub-type of model plant based on the GOR and initial production information, which characterized completion status, use of hydraulic fracturing, and location of the well. The GOR categories are gas wells (GOR greater than 100,000), oil with associated gas wells (GOR less than 100,000 and greater than 300), and heavy oil wells (GOR less than 300). Wells are categorized by GOR based on the total production in the base year (2014).

For newly completed or recompleted well sites, the EPA evaluated the emission reductions and cost of control for low production well sites, defined as sites in which the combined oil and natural gas production is less than 15 boe per day averaged over the first 30 days of production, separately from that of non-low production well sites. We used production information from the DrillingInfo data to estimate the proportion of well sites that would be classified as low production (less than 15 boe per day production) or non-low production (greater than 15 boe per day production) by calculating the proportion of wells in the dataset producing less than 7.5 boe per day, which is equivalent to the model plant, which is assumed to have two wells per site, producing fewer than 15 boe per day combined. These production levels were based on the initial production reported in DrillingInfo. The DrillingInfo field 'PRAC_IP_BOE' was used, which includes both liquid and gas production and is based on the second month production recorded for the well. The second month was used to represent practical initial production because the first month record may be a partial month depending on when production started. After estimating the number of new wells based on each subcategory and subtype that are subject to the 2016 NSPS OOOOa, we applied the same assumption of two wells per well site as used in the model plant analysis to obtain the number of each well site subject to the 2016 NSPS OOOOa. A discussion of how EPA estimated the transitions to and from low production status in later periods in presented in Section 3.2.3 above.

Additionally, the EPA published final amendments to the 2016 OOOOa rule on March 12, 2018 that created separate fugitives monitoring and repair requirements for well sites on the Alaska North Slope.[103] In summary, these amendments granted additional time for initial monitoring during cold weather months and required annual monitoring for these well sites. We used the location information from DrillingInfo to identify these well sites, and those in the states subject to fugitive emissions standards under state regulations.

Table A-1 shows the count of well sites in the base year (2014) for each model plant. In this table, wells are broken out into states of interest, including Alaska, California, Colorado and Texas.

Table A- 1 Well Completions in 2014 by Production Level and Well Type

	Non-low production wells			Low production wells		
Location	**Natural Gas**	***Oil (GOR >300)***	***Oil (GOR <300)***	**Natural Gas**	***Oil (GOR >300)***	***Oil (GOR <300)***
Alaska/North-Slope	2	59	2	0	4	0
Alaska/Other	14	6	1	6	1	0
California	9	298	575	2	133	581
Colorado	284	1,035	44	33	20	16
Louisiana	231	281	111	23	50	407
North Dakota	0	2,081	138	0	48	17
New Mexico	43	950	55	12	116	27
Ohio	169	290	10	71	97	134
Oklahoma	341	1,383	421	63	71	231
Pennsylvania	605	103	6	64	408	337
Texas	973	10,302	1,397	141	1,176	1,459
Utah	122	558	42	12	131	9
Wyoming	255	549	113	55	20	65
Other states	954	484	780	335	169	1,058

Source: DrillingInfo database extracted January 2018.[104]

We used the AEO2020 projection of wells drilled in the contiguous 48 states to estimate a year-by-year rate of change from 2014 through 2030. We applied that year by year rate of change to the estimated number of wells in 2014 from DrillingInfo, regardless of well type, to project the estimated number of new well sites through 2030, scaled to the AEO oil and natural gas drilling

[103] 83 FR 10628.
[104] Memorandum to Jameel Alsalam, EPA, Elizabeth Miller, EPA, and Melissa Weitz, EPA from Casey Pickering, ERG and Robyn Reid, ERG titled, *DI Desktop Data Processing Overview for OAP/OAQPS* located at Docket ID No. EPA-HQ-OAR-2017-0473. February 6, 2018.

activity projections. The estimated number of new or modified facilities using this well drilling-based approach varies across projection years depending on projected oil and natural gas drilling activity from the AEO.

In the process of estimating fugitive emissions controls at well sites in the baseline and regulatory options, the EPA accounted for wells that were assumed to be covered by state regulations. In cases where state regulations would achieve equal or greater controls as the 2016 NSPS OOOOa controls, the regulatory options in this reconsideration do not result in a change in applied controls. Based on EPA's analysis, programs in six states have enacted regulations we believe meet or exceed the 2016 NSPS OOOOa standard for fugitive emissions monitoring: California, Colorado, Ohio, Pennsylvania, Texas and Utah.[105] These states are broken out in Table A-1 above. In this analysis, we take the requirements from California, Colorado, Ohio, Pennsylvania, Texas, and Utah into account.[106]

A.4 Gathering and Boosting Stations and Transmission and Storage Compressor Stations

In addition to well sites, the fugitive emissions requirements apply to gathering and boosting stations, transmission compressor stations, and storage compressor stations. The GHGI is used to estimate the count of newly affected compressor stations in each year. The GHGI uses a variety of data sources and studies to estimate equipment counts and emissions. Many equipment counts are based on the data reported under the GHGRP, scaled up to reflect the total population including both GHGRP-reporting and non-reporting oil and natural gas facilities.

We estimated the number of new compressor stations, by type, by averaging the increases in the year-to-year changes in total national counts of equipment over the 10-year period from 2004

[105] For information on additional states that were examined and why they are not considered equivalent, see the TSD and the memo "Equivalency of State Fugitive Emissions Programs for Well Sites and Compressor Stations to Standards at 40 CFR Part 60, Subpart OOOOa", both of which are available in the docket.

[106] EPA proposed that certain fugitive emissions monitoring-related permits in Texas would be considered equivalent, but not all types of permits. At proposal, EPA did not have quantitative information on the share of Texas permits that, as proposed, would be considered equivalent. Information received during the public comment period for this action provides EPA with a basis to perform quantitative analysis for Texas facilities in this RIA. EPA also received additional information of the share of facilities in Utah that whose fugitive emissions monitoring-related emissions requirements would be considered equivalent to NSPS OOOOa requirements.

through 2014. Year-to-year increases were assumed to represent newly constructed facilities. Decreases in total counts were represented as zeros for that year, and average together with the annual increases. This approach results in the same number of new compressor stations in each projected year, regardless of increases or decreases in AEO projected drilling or production. These values reflect that construction of compressor stations and transmission pipelines are longer-term investments not necessarily correlated with short-term fluctuations in production. In addition, this approach may result in fewer total new and modified compressor stations for two reasons: (1) modifications of existing compressor stations are not captured, and (2) if existing compressor stations are closed and replaced with new facilities, those would not be reflected in the net increase in the year-to-year total. The national equipment counts estimated in the GHG Inventory are not disaggregated by state, therefore, activity data using this approach is only estimated at the national level. The average year-to-year increase for compressor stations is summarized in Table A-2.

Table A- 2 Average Year-to-Year Increases in Compressor Station Counts

Location	Average Year-to-Year Increase
Gathering and Boosting Stations	212
Transmission Compressor Stations	36
Storage Compressor Stations	2

A.5 Nationwide Activity Data for Other Equipment

Nationwide impacts of certifications for closed vent system design and technical infeasibility of routing pneumatic pumps to an existing control device, rod-packing replacements at reciprocating compressors, route-to-control measures for wet-seal centrifugal compressors, and use of low-bleed pneumatic controllers were calculated by estimating the count of affected facilities installed in a typical year and then using that typical year estimate to estimate the number of new affected facilities for each of the years in the study period, 2021 through 2030. Closed vent system and technical infeasibility certifications impact pneumatic pumps, centrifugal compressors, reciprocating compressors, and storage vessels. The other measures only generate impacts for sources in the transmission and storage segment in this final action.

The basis for the counts of affected facilities that would require closed vent system and technical infeasibility certifications in a typical year was information from 2016 NSPS OOOOa compliance information for 2017. The total number of new pneumatic pumps, centrifugal compressors, reciprocating compressors, and storage vessel affected facilities reported for 2017 are shown in Table A-3. These represent the number of new affected facilities in a "typical year." The GHGI was used to generate counts of reciprocating compressors and pneumatic controllers in transmission and storage only; those values are also included in the table.

Table A- 3 Nationwide Number of New Affected Facilities Reported in Compliance Reports for Year 2017

Type of Affected Facility	Total Count
Pneumatic Pumps	663
Reciprocating Compressors	180
Production and Processing	104
Transmission and Storage	76
Centrifugal Compressors	0
Storage Vessels	697
Pneumatic Controllers (Transmission and Storage Only)	308

A.5.1 Pneumatic Pumps

As shown in Table A-3, there were 663 pneumatic pump affected facilities reported in 2017. Per the definition of pneumatic pump affected facility in §60.5365a(h), the only pneumatic pumps subject to the 2016 NSPS OOOOa are natural gas-driven diaphragm pumps. It is therefore assumed that all the pneumatic pumps reported in 2017 were diaphragm pumps. The compliance information did not specify the number of pneumatic pumps at sites with a control device. Therefore, the percent of pneumatic pumps assumed to be controlled retains the assumption from the Final NSPS 2016 TSD and the 2018 NSPS Proposal TSD that 75 percent of the new pumps are at sites with a control device or a process to which the pump discharge could be routed. For these pumps, the owner or operator would either need a certification of the closed vent system or a certification that it is infeasible to route the pump discharge emissions to a control device/process. Therefore, an estimated 497 pneumatic pumps will need certifications in a typical year. No information was available to determine differences in the number of new pneumatic pumps year-by-year, so the estimate of 497 was assumed for each of the study years of 2021 through 2030.

A.5.2 Compressors

No centrifugal compressor affected facilities appeared in the 2017 compliance reports. Therefore, we assume that there will be no new wet-sealed centrifugal compressors for any of the study years.

As shown in Table A-3, there were 180 new reciprocating compressor affected facilities reported in 2017. Of those, 32 were located at gas processing plants (in the production and processing segment) and 148 were located at compressor stations. Because the reports did not distinguish between reciprocating compressors at gathering and boosting versus transmission and storage stations, we assumed that 76 were located at the latter (72 in transmission and 4 in storage) based on the average change in reciprocating compressors in the transmission and storage segment in the GHGI from 2004 to 2014 (censoring yearly changes below by zero). The remaining 72 compressors were assigned to gathering and boosting stations, and so 104 compressors in total were assumed to be in the production and processing segment.

Not all new reciprocating compressors require engineering certification. If an owner or operator complies via the rod packing replacement compliance option provided in the rule, there is no requirement to obtain a certification of a closed vent system. However, if an owner or operator of a reciprocating compressor complies with the rule by routing the rod packing emissions through a closed vent system to a process, they would be required to obtain a certification of the closed vent system. The compliance information did not contain information regarding the number of reciprocating compressors complying with each of these options, but it is anticipated that the majority of the owners and operators of reciprocating compressors will comply via the rod packing changeout option. In the absence of specific information, the assumption that 10 percent of the reciprocating compressor affected facilities in the production and processing segment (an estimated 10 reciprocating compressor affected facilities) would comply by routing the emissions through a closed vent system to a process and thus require a certification. No information was available to determine differences in the number of new reciprocating compressor affected facilities year-by-year, so the estimated 10 reciprocating compressor affected facilities was assumed for each of the analysis years of 2021 through 2030.

A.5.3 Storage Vessels

There were 697 new storage vessel affected facilities reported in the 2017 compliance reports. Each of these storage vessels are required to route emissions through a closed vent system to a control device and are therefore required to obtain a closed vent system certification. This number is considerably lower than the estimate assumed in the 2018 NSPS Proposal TSD. The reason EPA believes that the estimate assumed in the 2018 NSPS Proposal TSD and the number of reporting new storage vessel affected facilities differ is attributed to the fact that the majority of new storage vessels are subject to legally and practicable enforceable limits in operating permits or regulations that result in VOC emissions below the 6 tons per year applicability threshold and are therefore not be subject to the 2016 NSPS OOOOa rule. In order to estimate the year-by-year number of storage vessel affected facilities, the 2017 number of 697 new storage vessel affected facilities was adjusted proportionally based on the number of projected wells drilled in a given year, according to AEO2020 projections.

A.5.4 Pneumatic Controllers

The annual count of new high-bleed pneumatic controllers in transmission and storage is 308. This estimate was generated by calculating the average annual change in high-bleed controllers in transmission and storage from 2011 to 2014 in the GHGI. In years in which the number of controllers decreased, we assume that the number of new controllers was zero.

A.5.5 Summary of Affected Facilities Requiring Certification

Table A-4 summarizes the projected number of the facilities in the years 2021 through 2030 that are affected by this reconsideration that require certification under the 2016 NSPS OOOOa rule.

Table A- 4 Estimated Number of Affected Facilities Requiring Certifications, 2021-2030

Type of Affected Facility	Pneumatic Pumps	Centrifugal Compressors	Reciprocating Compressors	Storage Vessels	Total
2021	497	0	10	1,074	1,589
2022	497	0	10	1,127	1,642
2023	497	0	10	1,162	1,677
2024	497	0	10	1,182	1,697
2025	497	0	10	1,194	1,709
2026	497	0	10	1,205	1,720
2027	497	0	10	1,209	1,724
2028	497	0	10	1,216	1,731
2029	497	0	10	1,226	1,741
2030	497	0	10	1,219	1,734

APPENDIX B UNCERTAINTY ASSOCIATED WITH ESTIMATING THE SOCIAL COST OF METHANE

B.1 Overview of Methodology Used to Develop Interim Domestic SC-CH_4 Estimates

The domestic SC-CH_4 estimates rely on the same ensemble of three integrated assessment models (IAMs) that were used to develop the IWG global SC-CH_4 (and SC-CO_2) estimates: DICE 2010, FUND 3.8, and PAGE 2009.[107] The three IAMs translate emissions into changes in atmospheric greenhouse concentrations, atmospheric concentrations into changes in temperature, and changes in temperature into economic damages. The emissions projections used in the models are based on specified socio-economic (GDP and population) pathways. These emissions are translated into atmospheric concentrations, and concentrations are translated into warming based on each model's simplified representation of the climate and a key parameter, equilibrium climate sensitivity. The effect of these Earth system changes is then translated into consumption-equivalent economic damages. As in the IWG exercise, these key inputs were harmonized across the three models: a probability distribution for equilibrium climate sensitivity; five scenarios for economic, population, and emissions growth; and discount rates.[108] All other model features were left unchanged. Future damages are discounted using constant discount rates of both 3 and 7 percent, as recommended by OMB Circular A-4.

The domestic share of the global SC-CH_4 — *i.e.*, an approximation of the climate change impacts that occur within U.S. borders[109] — is calculated directly in both FUND and PAGE. However, DICE 2010 generates only global estimates. Therefore, the EPA approximates U.S. damages as 10 percent of the global values from the DICE model runs, based on the results from a regionalized version of the model (RICE 2010) reported in Table 2 of Nordhaus (2017).[110] Although the regional shares reported in Nordhaus (2017) are specific to SC-CO_2, they still

[107] The models' full names are as follows: Dynamic Integrated Climate and Economy (DICE); Climate Framework for Uncertainty, Negotiation, and Distribution (FUND); and Policy Analysis of the Greenhouse Gas Effect (PAGE).

[108] See the IWG's summary of its methodology in the docket, document ID number EPA-HQ-OAR-2015-0827-5886, "Addendum to Technical Support Document on Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12866: Application of the Methodology to Estimate the Social Cost of Methane and the Social Cost of Nitrous Oxide (August 2016)". See also National Academies (2017) for a detailed discussion of each of these modeling assumptions.

[109] Note that inside the U.S. borders is not the same as accruing to U.S. citizens, which may be higher or lower.

[110] Nordhaus, William D. 2017. Revisiting the social cost of carbon. *Proceedings of the National Academy of Sciences of the United States,* 114(7): 1518-1523.

provide a reasonable interim approach for approximating the U.S. share of marginal damages from methane emissions. Direct transfer of the domestic share from the SC-CO_2 may understate the U.S. share of the IWG global SC-CH_4 estimates based on DICE due to the combination of three factors: a) regional damage estimates are known to be highly correlated with output shares (Nordhaus 2017, 2014), b) the U.S. share of global output decreases over time in all five EMF-22 based socioeconomic scenarios used for the model runs, and c) the bulk of the temperature anomaly (and hence, resulting damages) from a perturbation in emissions in a given year will be experienced earlier for CH_4 than CO_2 due to the shorter lifetime of CH_4 relative to CO_2.

The steps involved in estimating the social cost of CH_4 are like those used for CO_2. The three integrated assessment models (FUND, DICE, and PAGE) are run using the harmonized equilibrium climate sensitivity distribution, five socioeconomic and emissions scenarios, constant discount rates described above. Because the climate sensitivity parameter is modeled probabilistically, and because PAGE and FUND incorporate uncertainty in other model parameters, the final output from each model run is a distribution over the SC-CH_4 in year *t* based on a Monte Carlo simulation of 10,000 runs. For each of the IAMs, the basic computational steps for calculating the social cost estimate in a particular year *t* are: 1.) calculate the temperature effects and (consumption-equivalent) damages in each year resulting from the baseline path of emissions; 2.) adjust the model to reflect an additional unit of emissions in year *t*; 3.) recalculate the temperature effects and damages expected in all years beyond *t* resulting from this adjusted path of emissions, as in step 1; and 4.) subtract the damages computed in step 1 from those in step 3 in each model period and discount the resulting path of marginal damages back to the year of emissions. In PAGE and FUND, step 4 focuses on the damages attributed to the US region in the models. As noted above, DICE does not explicitly include a separate US region in the model and therefore, the EPA approximates U.S. damages in step 4 as 10 percent of the global values based on the results of Nordhaus (2017). This exercise produces 30 separate distributions of the SC-CH_4 for a given year, the product of 3 models, 2 discount rates, and 5 socioeconomic scenarios. Following the approach used by the IWG, the estimates are equally weighted across models and socioeconomic scenarios in order to consolidate the results into one distribution for each discount rate.

B.2 Treatment of Uncertainty in Interim Domestic SC-CH_4 Estimates

There are various sources of uncertainty in the SC-CH_4 estimates used in this analysis. Some uncertainties pertain to aspects of the natural world, such as quantifying the physical effects of greenhouse gas emissions on Earth systems. Other sources of uncertainty are associated with current and future human behavior and well-being, such as population and economic growth, GHG emissions, the translation of Earth system changes to economic damages, and the role of adaptation. It is important to note that even in the presence of uncertainty, scientific and economic analysis can provide valuable information to the public and decision makers, though the uncertainty should be acknowledged and when possible taken into account in the analysis (National Academies 2013).[111] OMB Circular A-4 also requires a thorough discussion of key sources of uncertainty in the calculation of benefits and costs, including more rigorous quantitative approaches for higher consequence rules. This section summarizes the sources of uncertainty considered in a quantitative manner in the domestic SC-CH_4 estimates.

The domestic SC-CH_4 estimates consider various sources of uncertainty through a combination of a multi-model ensemble, probabilistic analysis, and scenario analysis. We provide a summary of this analysis here; more detailed discussion of each model and the harmonized input assumptions can be found in the 2017 National Academies report. For example, the three IAMs used collectively span a wide range of Earth system and economic outcomes to help reflect the uncertainty in the literature and in the underlying dynamics being modeled. The use of an ensemble of three different models at least partially addresses the fact that no single model includes all the quantified economic damages. It also helps to reflect structural uncertainty across the models, which stems from uncertainty about the underlying relationships among GHG emissions, Earth systems, and economic damages that are included in the models. Bearing in mind the different limitations of each model and lacking an objective basis upon which to differentially weight the models, the three integrated assessment models are given equal weight in the analysis.

[111] Institute of Medicine of the National Academies. 2013. Environmental Decisions in the Face of Uncertainty. The National Academies Press.

Monte Carlo techniques were used to run the IAMs many times. In each simulation the uncertain parameters are represented by random draws from their defined probability distributions. In all three models the equilibrium climate sensitivity is treated probabilistically based on the probability distribution from Roe and Baker (2007) calibrated to the IPCC AR4 consensus statement about this key parameter.[112] The equilibrium climate sensitivity is a key parameter in this analysis because it helps define the strength of the climate response to increasing GHG concentrations in the atmosphere. In addition, the FUND and PAGE models define many of their parameters with probability distributions instead of point estimates. For these two models, the model developers' default probability distributions are maintained for all parameters other than those superseded by the harmonized inputs (*i.e.*, equilibrium climate sensitivity, socioeconomic and emissions scenarios, and discount rates). More information on the uncertain parameters in PAGE and FUND is available upon request.

For the socioeconomic and emissions scenarios, uncertainty is included in the analysis by considering a range of scenarios selected from the Stanford Energy Modeling Forum exercise, EMF-22. Given the dearth of information on the likelihood of a full range of future socioeconomic pathways at the time the original modeling was conducted, and without a basis for assigning differential weights to scenarios, the range of uncertainty was reflected by simply weighting each of the five scenarios equally for the consolidated estimates. To better understand how the results vary across scenarios, results of each model run are available in the docket.

The outcome of accounting for various sources of uncertainty using the approaches described above is a frequency distribution of the SC-CH_4 estimates for emissions occurring in each year for each discount rate. Unlike the approach taken for consolidating results across models and socioeconomic and emissions scenarios, the SC-CH_4 estimates are not pooled across different discount rates because the range of discount rates reflects both uncertainty and, at least in part, different policy or value judgements; uncertainty regarding this key assumption is discussed in more detail below. The frequency distributions reflect the uncertainty around the input parameters for which probability distributions were defined, as well as from the multi-model ensemble and socioeconomic and emissions scenarios where probabilities were implied by the

[112] Specifically, the Roe and Baker distribution for the climate sensitivity parameter was bounded between 0 and 10 with a median of 3 °C and a cumulative probability between 2 and 4.5 °C of two-thirds.

equal weighting assumption. It is important to note that the set of SC-CH_4 estimates obtained from this analysis does not yield a probability distribution that fully characterizes uncertainty about the SC-CH_4 due to impact categories omitted from the models and sources of uncertainty that have not been fully characterized due to data limitations.

Figure B-1 presents the frequency distribution of the domestic SC-CH_4 estimates for emissions in 2020 for each discount rate. Each distribution represents 150,000 estimates based on 10,000 simulations for each combination of the three models and five socioeconomic and emissions scenarios.[113] In general, the distributions are skewed to the right and have long right tails, which tend to be longer for lower discount rates. To highlight the difference between the impact of the discount rate on the SC-CH_4 and other quantified sources of uncertainty, the bars below the frequency distributions provide a symmetric representation of quantified variability in the SC-CH_4 estimates conditioned on each discount rate. The full set of SC-CH_4 results through 2050 is available as part of the RIA analysis materials.

[113] Although the distributions in Figure 1 are based on the full set of model results (150,000 estimates for each discount rate), for display purposes the horizontal axis is truncated with 0.001 to 0.013 percent of the estimates lying below the lowest bin displayed and 0.471 to 3.356 percent of the estimates lying above the highest bin displayed, depending on the discount rate.

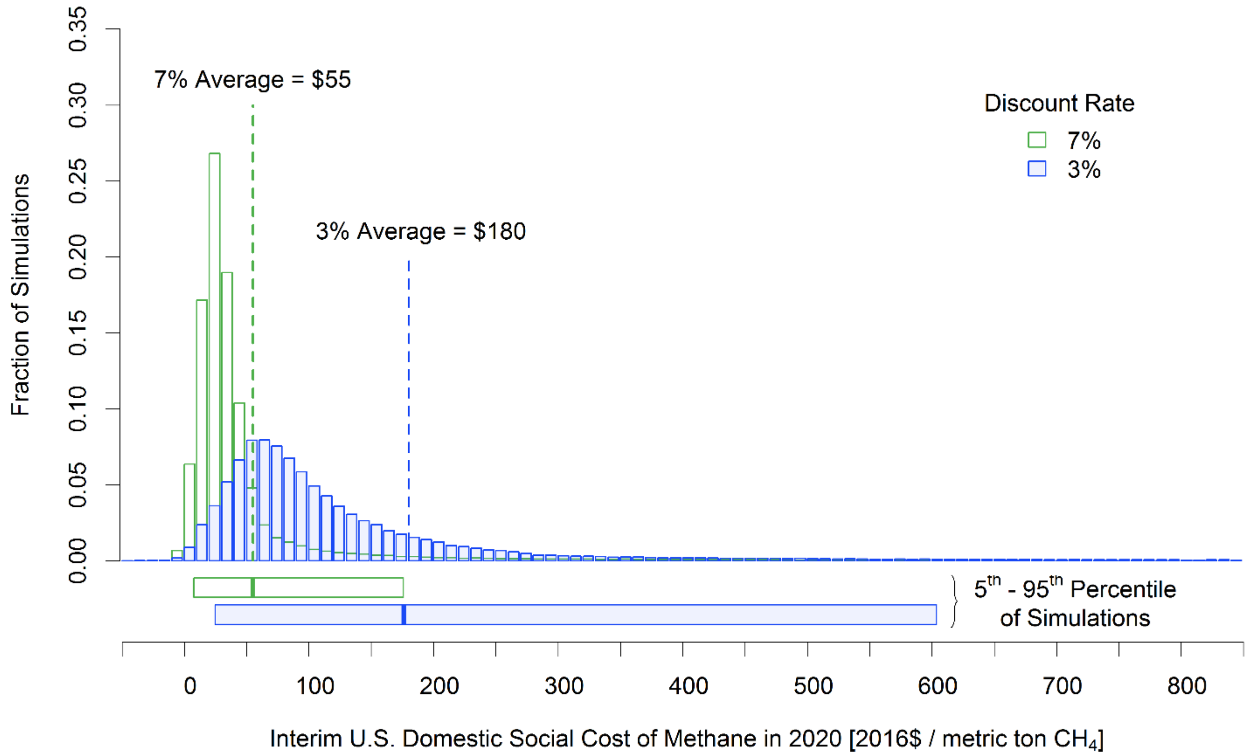

Figure B-1 Frequency Distribution of Interim Domestic SC-CH_4 Estimates for 2020 (in 2016$ per metric ton CH_4)

As illustrated by the frequency distributions in Figure B-1, the assumed discount rate plays a critical role in the ultimate estimate of the social cost of methane. This is because CH_4 emissions today continue to impact society far out into the future,[114] so with a higher discount rate, costs that accrue to future generations are weighted less, resulting in a lower estimate. Circular A-4 recommends that costs and benefits be discounted using the rates of 3 percent and 7 percent to reflect the opportunity cost of consumption and capital, respectively. Circular A-4 also recommends quantitative sensitivity analysis of key assumptions,[115] and offers guidance on what sensitivity analysis can be conducted in cases where a rule will have important intergenerational benefits or costs. To account for ethical considerations of future generations and potential

[114] Although the atmospheric lifetime of CH_4 is notably shorter than that of CO_2, the impacts of changes in contemporary CH_4 emissions are also expected to occur over long time horizons that cover multiple generations. For more discussion, see document ID number EPA-HQ-OAR-2015-0827-5886, "Addendum to Technical Support Document on Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12866: Application of the Methodology to Estimate the Social Cost of Methane and the Social Cost of Nitrous Oxide (August 2016)".

[115] "If benefit or cost estimates depend heavily on certain assumptions, you should make those assumptions explicit and carry out sensitivity analyses using plausible alternative assumptions." (OMB 2003, page 42).

uncertainty in the discount rate over long time horizons, Circular A-4 suggests "further sensitivity analysis using a lower but positive discount rate in addition to calculating net benefit using discount rates of 3 and 7 percent" (page 36) and notes that research from the 1990s suggests intergenerational rates "from 1 to 3 percent per annum" (OMB 2003). We consider the uncertainty in this key assumption by calculating the domestic SC-CH_4 based on a 2.5 percent discount rate, in addition to the 3 and 7 percent used in the main analysis.

Using a 2.5 percent discount rate, the average domestic SC-CH_4 estimate across all the model runs for emissions occurring in 2021 is $230 per metric ton of CH_4 (2016$).[116] For the Policy Review, the projected undiscounted forgone domestic climate benefits are $4.6 million in 2021.[117] By 2030, the average domestic SC-CH_4 using a 2.5 percent discount rate is $290 per metric ton of CH_4 (2016$), and the corresponding projected undiscounted forgone domestic climate benefits of the action increase to $15 million. The PV of the forgone domestic climate benefits under a 2.5 percent discount rate for the SC-CH_4 estimate and the stream of forgone benefits is $81 million, with a corresponding EAV of $9 million per year.

For the Technical Reconsideration, the projected undiscounted forgone domestic climate benefits are $3.9 million in 2021.[118] By 2030, the corresponding undiscounted forgone domestic climate benefits of the action increase to $20 million. The PV of the forgone domestic climate benefits under a 2.5 percent discount rate for the SC-CH_4 estimate and the stream of forgone benefits is $91 million, with a corresponding EAV of $10 million per year.

In addition to the approach to accounting for the quantifiable uncertainty described above, the scientific and economics literature has further explored known sources of uncertainty related to estimates of the social cost of carbon and other greenhouse gases. For example, researchers have examined the sensitivity of IAMs and the resulting estimates to different assumptions embedded

[116] The estimates are adjusted for inflation using the GDP implicit price deflator and then rounded to two significant digits.

[117] We make a distinction between the discounting used to generate the SC-CH_4 estimate, and the discounting applied to the stream of forgone climate benefits. Here, the former is based on a 2.5 percent discount rate, while the latter is undiscounted, *i.e.*, for each year, it is the product of the year-specific SC-CH_4 estimate and the estimated forgone methane reductions.

[118] We make a distinction between the discounting used to generate the SC-CH_4 estimate, and the discounting applied to the stream of forgone climate benefits. Here, the former is based on a 2.5 percent discount rate, while the latter is undiscounted, *i.e.*, for each year, it is the product of the year-specific SC-CH_4 estimate and the estimated forgone methane reductions.

in the models (see, *e.g.*, Hope 2013, Anthoff and Tol 2013, Nordhaus 2014, and Waldhoff et al. 2011, 2014). However, there remain additional sources of uncertainty that have not been fully characterized and explored due to remaining data limitations. Additional research is needed to expand the quantification of various sources of uncertainty in estimates of the social cost of carbon and other greenhouse gases (*e.g.*, developing explicit probability distributions for more inputs pertaining to climate impacts and their valuation). On the issue of intergenerational discounting, some experts have argued that a declining discount rate would be appropriate to analyze impacts that occur far into the future (Arrow et al., 2013). However, additional research and analysis is still needed to develop a methodology for implementing a declining discount rate and to understand the implications of applying these theoretical lessons in practice. The 2017 National Academies report also provides recommendations pertaining to discounting, emphasizing the need to more explicitly model the uncertainty surrounding discount rates over long time horizons, its connection to uncertainty in economic growth, and, in turn, to climate damages using a Ramsey-like formula (National Academies 2017). These and other research needs are discussed in detail in the 2017 National Academies' recommendations for a comprehensive update to the current methodology, including a more robust incorporation of uncertainty.

B.3 Forgone Global Climate Benefits

In addition to requiring reporting of impacts at a domestic level, OMB Circular A-4 states that when an agency "evaluate[s] a regulation that is likely to have effects beyond the borders of the United States, these effects should be reported separately" (page 15).[119] This guidance is relevant to the valuation of damages from GHGs, given that most GHGs (including CH_4) contribute to damages around the world independent of the country in which they are emitted. Therefore, in this section we present the forgone global climate benefits from this rulemaking using the global

[119] While Circular A-4 does not elaborate on this guidance, the basic argument for adopting a domestic only perspective for the central benefit-cost analysis of domestic policies is based on the fact that the authority to regulate only extends to a nation's own residents who have consented to adhere to the same set of rules and values for collective decision-making, as well as the assumption that most domestic policies will have negligible effects on the welfare of other countries' residents (EPA 2010; Kopp et al. 1997; Whittington et al. 1986). In the context of policies that are expected to result in substantial effects outside of U.S. borders, an active literature has emerged discussing how to appropriately treat these impacts for purposes of domestic policymaking (*e.g.*, Gayer and Viscusi 2016, 2017; Anthoff and Tol, 2010; Fraas et al. 2016; Revesz et al. 2017). This discourse has been primarily focused on the regulation of greenhouse gases (GHGs), for which domestic policies may result in impacts outside of U.S. borders due to the global nature of the pollutants.

SC-CH_4 estimates — *i.e.*, reflecting quantified impacts occurring in both the U.S. and other countries — corresponding to the model runs that generated the domestic SC-CH_4 estimates used in the main analysis. The average global SC-CH_4 estimate across all the model runs for emissions occurring over the years analyzed in this RIA (2021-2030) range from $380 to $530 per metric ton of CH_4 emissions (in 2016 dollars) using a 7 percent discount rate, and $1,400 to $1,800 per metric ton of CH_4 using a 3 percent discount rate.[120] The domestic SC-CH_4 estimates presented above are approximately 15 percent and 13 percent of these global SC-CH_4 estimates for the 7 percent and 3 percent discount rates, respectively.

Forgone Global Climate Benefits for Policy Review: Applying these estimates to the forgone CH_4 emission reductions under the Policy Review results in estimated undiscounted forgone global climate benefits ranging from $7.6 million in 2021 to $28 million in 2030, using a 7 percent discount rate for the SC-CH_4 estimate. The PV of the forgone global climate benefits using a 7 percent discount rate for the SC-CH_4 estimate and the stream of forgone benefits is $110 million, with an associated EAV of $15 million per year.

The estimated undiscounted forgone global climate benefits under the Policy Review are $29 million in 2021 and increase to $96 million in 2030 using a 3 percent rate for the SC-CH_4 estimate. The PV of the forgone global climate benefits using a 3 percent discount rate for the SC-CH_4 estimate and the stream of forgone benefits is $500 million, with an associated EAV of $56 million per year.

Under the sensitivity analysis considered above using a 2.5 percent discount rate, the average global SC-CH_4 estimate across all the model runs for emissions occurring in 2021-2030 ranges from $1,900 to $2,300 per metric ton of CH_4 (2016$). The undiscounted forgone global climate benefits under the Policy Review are estimated to be $38 million in 2021 and $120 million in 2030 using a 2.5 percent discount rate for the SC-CH_4 estimate. The PV of the forgone global climate benefits using a 2.5 percent discount rate for the SC-CH_4 estimate and the stream of forgone benefits is $660 million, with an associated EAV of $74 million per year. All estimates are reported in 2016 dollars.

[120] The estimates are adjusted for inflation using the GDP implicit price deflator and then rounded to two significant digits.

Forgone Global Climate Benefits for Technical Reconsideration: Applying these estimates to the forgone CH_4 emission reductions under the Technical Reconsideration results in estimated undiscounted forgone global climate benefits ranging from $6.5 million in 2021 to $36 million in 2030, using a 7 percent discount rate for the SC-CH_4 estimate. The PV of the forgone global climate benefits using a 7 percent discount rate for the SC-CH_4 estimate and the stream of forgone benefits is $123 million, with an associated EAV of $16 million per year.

The estimated undiscounted forgone global climate benefits under the Technical Reconsideration are $24 million in 2021 and increase to $124 million in 2030 using a 3 percent rate for the SC-CH_4 estimate. The PV of the forgone global climate benefits using a 3 percent discount rate for the SC-CH_4 estimate and the stream of forgone benefits is $560 million, with an associated EAV of $64 million per year.

Under the sensitivity analysis considered above using a 2.5 percent discount rate, the undiscounted forgone global climate benefits under the Technical Reconsideration are estimated to be $32 million in 2021 and $160 million in 2030. The PV of the forgone global climate benefits using a 2.5 percent discount rate for the SC-CH_4 estimate and the stream of forgone benefits is $750 million, with an associated EAV of $83 million per year. All estimates are reported in 2016 dollars.

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United States Environmental Protection Agency	Office of Air Quality Planning and Standards Health and Environmental Impacts Division Research Triangle Park, NC	Publication No. EPA-452/R-20-004 July 2020

States of California, Colorado, Connecticut, Delaware, Illinois, Iowa, Maine, Maryland, Michigan, Minnesota, New Jersey, New Mexico, New York, North Carolina, Oregon, Rhode Island, Vermont, Washington, the Commonwealths of Massachusetts and Pennsylvania, the District of Columbia, the City of Chicago, the City and County of Denver, and the Colorado Department of Public Health and Environment

November 22, 2019

Via Electronic Transmission

EPA Docket Center (EPA/DC)
Docket ID No. EPA-HQ-OAR-2017-0483
U.S. Environmental Protection Agency
Mail Code 28221T
1200 Pennsylvania Avenue, NW
Washington, DC 20460
a-and-r-Docket@epa.gov

RE: Comments on Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review, 84 Fed. Reg. 50,244 (Sept. 24, 2019)

Attention: Docket ID No. EPA-HQ-OAR-2017-0757

Dear Administrator Wheeler,

The States of California,[1] Colorado, Connecticut, Delaware, Illinois, Iowa, Maine, Maryland, Michigan, Minnesota, New Jersey, New Mexico, New York, North Carolina, Oregon, Rhode Island, Vermont, Washington, the Commonwealths of Massachusetts and Pennsylvania, the District of Columbia, the City of Chicago, the City and County of Denver, and the Colorado Department of Public Health and Environment ("States and Cities") respectfully submit these comments on the Environmental Protection Agency's ("EPA") proposed rule titled "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review," 84 Fed. Reg. 50,244 (Sept. 24, 2019) ("Proposed Rule" or "Proposal"). As detailed in these comments, the States and Cities oppose the Proposed Rule and continue to support EPA's 2016 emission standards for new, reconstructed, and modified sources in the oil and natural gas sector codified at 40 Code of Federal Regulations part 60, subpart OOOOa ("2016 Standard").[2]

The Proposed Rule is the latest and most far-reaching attempt by EPA to dismantle the 2016 Standard. To date, EPA has tried to stay, delay, and revise the 2016 Standard. But now it seeks to entirely eliminate federal regulation of methane emissions from the oil and natural gas sector. In doing so, EPA turns a blind eye to its own legal and factual findings that the oil and

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[1] The California Attorney General submits these comments pursuant to his independent power and duty to protect the environment and natural resources of the State. *See* Cal. Const., art. V, § 13; Cal. Gov. Code, §§ 12511, 12600-12612; *D'Amico. v. Bd. of Medical Examiners* (1974) 11 Cal.3d 1, 1415.
[2] 81 Fed. Reg. 35,824 (June 3, 2016).

natural gas sector is the largest source of methane in the United States; that methane is a potent greenhouse gas (GHG); that the oil and natural gas sector contributes significantly to air pollution that may reasonably be anticipated to endanger public health or welfare; and that methane emission from the oil and natural gas sector should be directly addressed through the best system for their reduction.

Indeed, EPA acknowledges that the Proposed Rule will *increase* emissions of methane, volatile organic compounds ("VOCs"), and hazardous air pollutants as compared to the 2016 Standard.[3] VOCs are a chemical precursor to ozone formation, and exposure to ozone poses a significant threat to public health, particularly the health of vulnerable populations including children, older adults, and those suffering from chronic lung disease and asthma.[4] And, the federal government's own scientists have underscored the overwhelming evidence of the environmental, public health, economic, and national security impacts of climate change resulting from anthropogenic emissions of GHGs, including methane.[5] The States and Cities have a demonstrated, legally protected interest in protecting our residents from harmful air pollution that contributes to climate change and endangers public health and welfare. We are already experiencing adverse impacts from climate change[6] and these climate-related impacts will only get worse and their costs will mount dramatically if GHG emissions continue unabated or increase.[7] Thus, the overwhelming scientific consensus is that immediate and continual progress toward a near-zero GHG-emissions economy by mid-century is necessary to avoid truly catastrophic climate change impacts.[8]

To that end, the States and Cities have long called for the federal government to regulate methane emissions from the oil and natural gas sector under section 111 of the Clean Air Act. In 2012, several of the undersigned filed a notice of intent to sue EPA for failing to make a determination of whether to regulate methane emissions from the oil and natural gas industry.

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[3] 84 Fed. Reg. 50,244, 52,059.
[4] 81 Fed. Reg. at 35,837.
[5] *See* U.S. Global Change Research Program, *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* (D.R. Reidmiller et al. eds., 2018), *available at* https://nca2018.globalchange.gov/ (the "Assessment").
[6] *See* Attachment 1, Climate Change Impacts of the States and Cities.
[7] Assessment, Summary of Findings at 26 ("With continued growth in emissions at historic rates, annual losses in some economic sectors are projected to reach hundreds of billions of dollars by the end of the century—more than the current gross domestic product (GDP) of many U.S. states.").
[8] *See id.*; *see also* Intergovernmental Panel on Climate Change (IPCC), *Global Warming of 1.5°C – Summary for Policymakers* at 12, (2018), https://report.ipcc.ch/sr15/ ("In model pathways with no or limited overshoot of 1.5°C, global net anthropogenic CO2 emissions decline by about 45% from 2010 levels by 2030 . . . , reaching net zero around 2050 . . . . Non-CO2 emissions in pathways that limit global warming to 1.5°C show deep reductions that are similar to those in pathways limiting warming to 2°C (high confidence).").

This notice was followed by the submittal of comments on EPA's actions leading up to and including the 2016 Standard. And as demonstrated by our actions to date, the States and Cities will not stand back as EPA seeks to upend the 2016 Standard. In 2017, when EPA withdrew a request seeking information on methane emissions from existing sources, the States and Cities objected. When EPA issued a stay of the 2016 Standard, the States and Cities intervened in litigation that successfully challenged the stay as unlawful. When EPA attempted to stay the 2016 Standard again, the States and Cities submitted comments in opposition. When EPA attempted to revise the 2016 Standard last year, the States and Cities opposed.

Now again, the States and Cities voice their opposition. If EPA finalizes the Proposed Rule, our residents will be exposed to and harmed by the impacts of methane, VOCs, and hazardous air pollutant emissions that would otherwise have been avoided if the 2016 Standard's requirements remained in force. As detailed herein, the Proposed Rule fails to pass legal muster for the following reasons:

- First, the Proposed Rule is arbitrary and capricious and unlawful under the Clean Air Act. Although the Proposed Rule sets forth a "primary proposal" and an "alternative proposal," at base, the Proposed Rule seeks to rescind the regulation of methane from the 2016 Standard. But, based on the extensive rulemaking record for the 2016 Standard, EPA had a rational basis to regulate methane. The Proposed Rule is arbitrary and capricious for failing to justify EPA's change of position in light of that record.

- Further, the Proposed Rule violates the Clean Air Act because EPA has a nondiscretionary duty to regulate methane emissions. Under EPA's long-standing interpretation of section 111(b) of the Clean Air Act, in the 2016 rulemaking, EPA also: (1) revised the oil and natural gas source category to include production, processing, transmission, and storage; and (2) determined that the oil and natural gas source category contributes significantly to air pollution—including GHGs—that may reasonably be anticipated to endanger public health or welfare.[9] Thus, EPA remains statutorily obligated to regulate methane emissions from the oil and natural gas source category.

- The Proposed Rule is also unlawful because it would remove the transmission and storage segment from the source category resulting in an increase in air pollution. EPA's proposed revision stands in direct contravention of EPA's prior endangerment and significant contribution finding as well as the goals of the Clean Air Act. Revising the scope of the source category is also arbitrary and capricious because EPA reasonably interpreted the original listing of the oil and natural gas source category to broadly cover the natural gas industry given the interrelated nature of the operations, equipment, and emissions.

- Further, the Proposed Rule is arbitrary and capricious because EPA fails to adequately consider the implications of its action on existing sources in the oil and natural gas industry.

[9] 81 Fed. Reg. at 35,840.

Methane emissions from existing sources constitute the majority of methane emissions from this source category. The Proposed Rule is a transparent attempt by EPA to avoid its statutory obligation to regulate methane emissions from the largest industrial source of such emissions. Despite acknowledging that the Proposed Rule will remove its statutory obligations to promulgate methane guidelines for controlling methane emissions from existing sources,[10] EPA fails to adequately or rationally analyze and account for that effect of the Proposal.

- Finally, the Proposed Rule's alternative new interpretation of section 111(b) of the Clean Air Act would be contrary to the statute. EPA is not required to make a pollutant-specific significant contribution finding for GHG emissions, or for methane specifically, from the oil and natural gas source category as a prerequisite to regulating those emissions. EPA has failed to provide adequate justification for departing from its long-standing statutory interpretation as set forth in the rulemaking record for the 2016 Standard.

For these reasons, and as further detailed below, our States and Cities strongly oppose the Proposed Rule and respectfully request that EPA withdraw it and implement and enforce the 2016 Standard's important public health and environmental protections.

I. Legal and Factual Background

A. Statutory and Regulatory Framework

Section 111 of the Clean Air Act contains the New Source Performance Standards ("NSPS") program, which requires EPA to follow certain steps in regulating categories of stationary (non-vehicle) sources of air pollution. First, EPA must establish a list of source categories and "shall include a category of sources in such list if in [the EPA Administrator's] judgment it causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare."[11] To date, EPA has evaluated the emissions from both new sources and existing sources from the source category in making this determination, "and the D.C. Circuit has upheld that industry-wide approach."[12]

Once it has listed a source category, EPA "shall" promulgate "standards of performance" for new sources in that source category.[13] A "standard of performance" means "a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy

[10] *Id.* at 50,271.
[11] 42 U.S.C. § 7411(b)(1)(A).
[12] 84 Fed. Reg. at 50.269 n.85 (citing *Nat'l Lime Ass'n v. EPA*, 627 F.2d 416, 433 n.48 (D.C. Cir. 1980); *Nat'l Asphalt Pavement Ass'n v. Train*, 539 F.2d 775, 779-82 (D.C. Cir. 1976)).
[13] 42 U.S.C. § 7411(b)(1)(B).

requirements) the Administrator determines has been adequately demonstrated."[14] EPA sets performance standards for new sources by reference to emissions levels that can be achieved using the most up-to-date control technology that is both feasible and cost-effective for each type of pollutant, but it does not mandate any specific equipment or technology.[15] Under the Clean Air Act, an existing source that is modified or reconstructed after regulations are proposed for new sources is also considered a new source.[16] At least every eight years, EPA must "review and, if appropriate, revise such standards following the procedure required . . . for promulgation of such standards."[17]

When EPA establishes performance standards for new sources in a particular source category, EPA is also required under section 111(d) of the Clean Air Act and applicable regulations to publish guidelines for controlling emissions from existing sources in that source category, subject to two narrow exceptions that, despite EPA's assertions to the contrary, are not applicable here. EPA's regulations provide that such guidelines will be issued "[c]oncurrently upon or after proposal of [section 111(b)] standards of performance for the control of a designated pollutant from affected facilities."[18] After EPA issues final guidelines for existing sources for a designated pollutant, states must submit plans containing emission standards for control of that pollutant from designated facilities within the state.[19] Thus, the obligation to control emissions of a designated pollutant from existing sources is triggered by EPA's issuance of final emission guidelines, the issuance of which, in turn, is triggered by issuance of new source performance standards. Absent such guidelines, emissions of such pollutant from existing sources may not otherwise be regulated under section 111 of the Clean Air Act.

B. Emissions from the Oil and Natural Gas Industry Endanger Public Health and Welfare

According to EPA, the oil and natural gas industry is the largest emitter of methane in the United States.[20] Methane emissions from oil and natural gas sources in existence before 2012 constitute the majority of methane emissions from the oil and natural gas sector in the United States.[21] EPA's 2019 "Inventory of U.S. Greenhouse Gas Emissions and Sinks" indicates that total methane emissions from the oil and gas industry account for about 29 percent of the total methane emissions from all U.S. sources. Methane is a potent greenhouse gas that, pound for pound, warms the earth eighty-four to eighty-six times more than carbon dioxide for the first two decades after release and twenty-eight to thirty-six times more over a one hundred-year

[14] 42 U.S.C. § 7411(a)(1).
[15] 42 U.S.C. § 7411(a)(1) & (b)(5).
[16] 42 U.S.C. § 7411(a)(2); 40 C.F.R. § 60.15.
[17] 42 U.S.C. § 7411(b)(1)(B).
[18] 40 C.F.R. § 60.22a(a).
[19] 40 C.F.R. § 60.23a(a)(1).
[20] 84 Fed. Reg. at 50249.
[21] See Attachments 2 & 3 (EPA Admissions at ¶ 8; EPA Answer at ¶ 35.).

timeframe.[22] According to the Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report (2013), methane is the second leading climate-forcing agent after carbon dioxide globally. Numerous scientific assessments, including EPA's 2009 Endangerment Finding,[23] establish that anthropogenic GHG emissions, including methane, contribute to climate change and may reasonably be anticipated to endanger public health and welfare. EPA has found that methane "contributes to warming of the atmosphere, which, over time, leads to increased air and ocean temperatures, changes in precipitation patterns, melting and thawing of global glaciers and ice, increasingly severe weather events, such as hurricanes of greater intensity and sea level rise."[24]

Scientific assessments since the 2009 Endangerment Finding have only strengthened the case that anthropogenic GHG emissions endanger public health and welfare, and we are currently seeing new records for climate change indicators such as increased global average surface temperatures (fifteen of the last sixteen years have been the warmest on record), Arctic sea ice retreat, and increased GHG concentrations in the atmosphere.[25] Indeed, the Assessment concludes that "[g]reenhouse gas emissions from human activities are the only factors that can account for the observed warming over the last century" and emphasizes that "[t]he impacts of climate change are already being felt in the United States and are projected to intensify in the future."[26] To highlight just two of its troubling findings, the Assessment states that, "[i]mpacts from climate change on extreme weather and climate-related events, air quality, and the transmission of disease through insects and pests, food, and water increasingly threaten the health and well-being of the American people, particularly populations that are already vulnerable."[27] Similarly, the Assessment concludes that "[o]ur aging and deteriorating infrastructure is further stressed by increases in heavy precipitation events, coastal flooding, wildfires, and other extreme events, as well as changes to average precipitation and temperature."[28]

In addition, the oil and natural gas industry is a source of significant emissions of VOCs and hazardous air pollutants. The public health impacts of VOCs are well documented. VOCs are a main precursor to the formation of ozone, which can cause harmful respiratory symptoms such as airway inflammation and asthma.[29] Long-term exposure to VOCs can also result in premature death from lung and heart disease.[30] Children and people with respiratory disease are

[22] *See* Attachment 2, EPA Admissions at ¶¶ 1 & 2.
[23] *See* "Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act; Final Rule," 74 Fed. Reg. 66,496 (Dec. 15, 2009).
[24] 77 Fed. Reg. 49,490, 49,535 (Aug. 23, 2011).
[25] 81 Fed. Reg. at 35,834-36.
[26] Assessment at 2, 8-9.
[27] *Id.* at ch. 6.
[28] Assessment at ch. 10.
[29] *See* Regulatory Impact Analysis for the Proposed Rule ("RIA) at 3-15, 3-16.
[30] *Id.*

most at risk.[31] EPA has further found that harmful hazardous air pollutants associated with natural gas, like formaldehyde and benzene, cause cancer and other adverse health effects.[32]

C. Regulation of the Oil and Natural Gas Industry under Section 111

In 1979, based on emissions from the source category as a whole (including emissions from existing sources), EPA listed crude oil and natural gas production as a source category that contributes significantly to air pollution that may reasonably be anticipated to endanger public health and welfare.[33] EPA originally promulgated standards of performance for the oil and natural gas sector in 1985.[34] The eight-year deadline for reviewing these standards expired in 1993. EPA failed to timely review the standards of performance, leading multiple groups to file suit in 2009 to compel such review. That case, *Wild Earth Guardians v. EPA*, No. 1:09-CV-00089 (D.D.C.), resulted in a consent decree setting forth a schedule for proposing any final revisions by November 30, 2011. EPA proposed revisions to the oil and natural gas NSPS in August 2011,[35] and signed a final rule to complete the mandated review for oil and natural gas operations on April 17, 2012.[36] However, EPA did not establish performance standards or emission guidelines for methane emissions in 2012. Instead, EPA stated "we intend to continue to evaluate the appropriateness of regulating methane with an eye toward taking additional steps if appropriate."[37] The agency stated that "over time," it would assess emissions data received pursuant to the recently implemented greenhouse gas emissions reporting program, which would help it evaluate whether to directly regulate methane and identify cost-effective ways to do so.[38]

On December 11, 2012, New York, Connecticut, Delaware, Maryland, Massachusetts, Rhode Island, and Vermont notified EPA of their intent to sue the agency for violating the Clean Air Act by failing to adopt limits on methane emissions from equipment used in oil and natural gas production, processing, and transmission in the 2012 Standard.[39] As explained in that notice letter, EPA had determined that methane emissions endanger public health and welfare, and that processes and equipment in the oil and natural gas sector emit vast quantities of methane. EPA had compelling data, including from eighteen years of experience administering the voluntary Natural Gas Star Program (a public-private partnership with the oil and natural gas industry

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[31] *Id.*
[32] *Id.* at 3-19 to 3-27.
[33] *See* Priority List and Additions to the List of Categories of Stationary Sources, 44 Fed. Reg. 49,222 (Aug. 21, 1979).
[34] 50 Fed. Reg. 26,122; 50 Fed. Reg. 40,158.
[35] 76 Fed. Reg. 52,738 (Aug. 23, 2011)
[36] 77 Fed. Reg. 49,490 (Aug. 16, 2012) ("2012 Standard").
[37] *Id.* at 49,513.
[38] *Id.*
[39] *See* Attachment 4, Clean Air Act Notice of Intent to Sue Letter to Lisa P. Jackson, Administrator, U.S. Environmental Protection Agency, from New York, Connecticut, Delaware, Maryland, Massachusetts, Rhode Island, and Vermont (Dec. 11, 2012).

launched in 1993) demonstrating that many measures to avoid or reduce methane leaks from new and existing oil and natural gas operations were available and cost-effective. In light of EPA's findings, those States asserted that EPA's failure in its 2012 rulemaking to determine whether standards limiting methane emissions from oil and natural gas operations under section 111 of the Clean Air Act were appropriate was a violation of a nondiscretionary duty of the Administrator and constituted an unreasonable delay in taking agency action.

After 2012, additional studies confirmed that the oil and natural gas sector is the largest industrial source of methane emissions, accounting for a third of total methane emissions in the United States.[40] Recognizing the importance of reducing methane emissions, in June 2013, President Obama issued a Climate Action Plan, which directed EPA and other federal agencies to develop a comprehensive interagency strategy to reduce methane emissions. In March 2014, the President built on the Climate Action Plan with a Strategy to Reduce Methane Emissions. That strategy identified methane reductions as an important step to achieve near-term beneficial impacts in mitigating global climate change and committed EPA to assessing significant sources of methane and other emissions from the oil and natural gas sector, soliciting input from independent experts through a series of technical white papers, and determining how best to pursue further methane reductions from these sources. Many of the undersigned Attorneys General filed comments on the EPA white papers advocating for the direct regulation of methane from new and existing oil and natural gas development and delivery equipment.[41] States that had noticed their intent to sue EPA over its failure to address oil and natural gas sector methane emissions withheld suit as these efforts took shape.

In January 2015, the Administration announced its goal to cut methane emissions from the oil and natural gas sector by as much as forty-five percent from 2012 levels by 2025. In September 2015, EPA proposed regulations to require new and modified equipment to meet standards to limit their methane emissions.[42] Many of the undersigned Attorneys General submitted comments on the proposed standards for new and modified sources, and further urged EPA to move forward expeditiously with regulation of existing sources.[43]

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[40] *See* Oil and Natural Gas Sector: Emission Standards for New and Modified Sources, Proposed Rule, 80 Fed. Reg. 56,593.

[41] *See* Attachment 5, Letter from Eric T. Schneiderman, et al., to Gina McCarthy, "Re: Comments on EPA Methane White Papers" (June 16, 2014) (signed by attorneys general of Delaware, Maryland, Massachusetts, New York, Oregon, Rhode Island, and Vermont); Attachment 6, Letter from Eric Schneiderman, et al., to Janet McCabe, "Re: Addressing Methane Emissions from Distribution Sector" (Sept. 12, 2014) (signed by attorneys General of Delaware, Maryland, Massachusetts, New York, Oregon, Rhode Island, and Vermont).

[42] 80 Fed. Reg. 56,593 (Sept. 18, 2015).

[43] *See* Attachment 7, Letter from Attorneys General of New York, Massachusetts, Oregon, Rhode Island, and Vermont to United States Environmental Protection Agency, Docket ID No. EPA-HQ-OAR-2010-0505 (Dec. 4, 2015).

D. The 2016 Standard[44]

On June 3, 2016, pursuant to its authority under section 111(b) of the Clean Air Act, EPA finalized the 2016 Standard to reduce emissions of methane, VOCs and other pollutants from new and modified production, gathering, processing, transmission and storage equipment in the oil and natural gas industry.[45] Specifically, the 2016 Standard targets the following sources of methane and VOC emissions: hydraulically fractured oil well completions, pneumatic pumps, fugitive emissions from well sites and compressor stations, and equipment leaks at natural gas processing plants.[46] EPA encouraged the use of emerging technology in leak monitoring and set a fixed schedule for monitoring leaks of twice per year for all well sites and four times per year for all compressor stations.[47] According to EPA, the 2016 Standard is expected to reduce 300,000 tons of methane, 150,000 tons of VOCs, and 1,900 tons of hazardous air pollutants (as a co-benefit of reducing VOCs) in 2020.[48] In 2025, the rule would reduce 510,000 tons of methane, 210,000 tons of VOCs, and 3,900 tons of hazardous air pollutants.[49] EPA analyzed the costs and benefits of the 2016 Standard, including the revenues from recovered natural gas that would otherwise be lost, and determined that the 2016 Standard would result in a net benefit estimated at $35 million in 2020 and $170 million in 2025.[50]

The 2016 Standard also complements state regulation to control methane emissions from the oil and natural gas sector. For example, California's regulation, approved by the California Air Resources Board in March 2017, requires quarterly monitoring and repairing of methane leaks from both onshore and offshore oil and natural gas wells, natural gas processing facilities, compressor stations, and other equipment used in the processing and delivery of oil and natural gas.[51] California's regulation requires oil and natural gas operators above a certain size to implement vapor recovery systems that will capture methane so that it can be reused. California's regulation seeks to curb methane emissions at oil and natural gas production facilities by up to forty-five percent over the next nine years.[52] Colorado adopted rules in February 2014 that govern new and existing well production facilities and natural gas

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[44] The Primary Documents and Supporting Documents for the 2016 Standard *available at* https://www.regulations.gov/docket?D=EPA-HQ-OAR-2010-0505 are attached hereto as Attachment 15.
[45] 81 Fed. Reg. 35,824 (June 3, 2016).
[46] *Id.* at 35,825.
[47] *Id.* at 35,826, 35,846.
[48] *Id.* at 35,827.
[49] *Id.*
[50] *Id.* at 35,827-28.
[51] *See* Cal. Code Regs. tit. 17, §§ 95665, *et seq.*
[52] New York is also moving ahead to develop, propose and adopt, as necessary, regulations to limit emissions from existing oil and natural gas transmission facilities, such as compressor stations, not regulated by the federal New Source Rule. *See* New York Methane Reduction Plan (May 2017), *available at* http://www.dec.ny.gov/docs/administration_pdf/mrpfinal.pdf.

compressor stations.[53] Colorado requires leak inspections either monthly, quarterly, annually, or one time, depending on facility emissions. These regulations are expected to reduce methane emissions from Colorado's oil and natural gas sector by approximately 64,000 tons per year. Colorado strengthened those regulations in November 2017 to increase the frequency of leak detection inspections for oil and natural gas wells in ozone nonattainment areas, and to mandate inspections of pneumatic controllers to confirm proper operation and necessary responsive actions.[54] California and Colorado are not alone: New Mexico, Pennsylvania, Texas, Utah, and Wyoming have proposed or enacted leak detection and repair standards, all of which require more frequent inspections than does EPA's Proposed Rule. Even with these robust state efforts, EPA action is needed—and, indeed, required—under the Clean Air Act, to ensure baseline national standards of performance in the oil and natural gas sector, especially in states with no such backstop programs.

EPA's promulgation of the 2016 Standard triggered its obligation to issue methane emission guidelines for existing sources. Although the agency did not concurrently issue guidelines, it did concurrently publish a notice that it would be issuing an information collection request (ICR) to obtain "more specific information that would be of critical use in addressing existing source emissions pursuant to CAA section 111(d)."[55] After two rounds of notice and comment, and review by the Office of Management and Budget, EPA issued the final methane ICR on November 10, 2016 and began receiving the requested information from oil and natural gas operators in January 2017.

E. EPA's 180 Degree Reversal on Regulating Methane from the Oil and Natural Gas Industry Under Section 111

The current Administration has stayed, delayed, revised, and now proposes to entirely reverse federal efforts to control methane emissions from the oil and natural gas sector. In March 2017—one day after a request from Attorneys General with whom he was previously allied in opposing EPA rules[56]—the then-EPA Administrator withdrew, without any notice or opportunity to comment, EPA's ICR to the oil and natural gas industry requesting information on

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[53] 5 Colo. Code Regs. §1001-9:XVII.F.
[54] 5 Colo. Code Regs. §1001-9:0, Section XII.L (2018). Table 9 of the Proposed Rule indicates that Colorado currently has regulations on the transmission and storage segment (84 Fed. Reg. at 50,277), but EPA offers no citation in support. In fact, Colorado currently has no air quality regulations imposing control requirements or directed to seeking reductions of VOC or methane from this segment of the industry. Colorado currently relies on the reductions achieved by the 2016 Standard.
[55] 81 Fed. Reg, 35,763, 35,764 (June 3, 2016).
[56] *See* Letter from Ken Paxton, Texas Attorney General, et al., to Scott Pruitt, U.S. EPA Administrator (Mar. 1, 2017), *available at* https://www.epa.gov/sites/production/files/2017-03/documents/letter_from_attorneys_general_and_governors.pdf.

methane emissions from existing sources.[57] The withdrawal was not based upon any reasoned analysis by EPA,[58] but instead spurred by a request from an oil and natural gas industry lobbyist who urged "several key rationales for either eliminating the ICR or at least extending the response date."[59] That request was shepherded by a politically-appointed member of the new Administration's transition team, who thanked the lobbyist "for bringing it to our attention," explaining that "[t]here was nobody here (political or career) who thought the ICR made sense given the changes in associated policy," and apologized that "with all of the commotion of the transition, the very sensible proposal to cancel the ICR fell through the cracks."[60] Within a matter of weeks, the ICR was withdrawn and EPA's process to regulate existing sources halted, based on an apparent change in policy that occurred without any public process or record in support.

Several weeks later, on March 28, 2017, President Trump issued Executive Order No. 13783,[61] which directed agencies to review existing regulations and "appropriately suspend, revise, or rescind those that unduly burden the development of domestic energy resources …."[62] In April 2017, EPA initiated its E.O. review of the 2016 Standard[63] and announced that it had convened a proceeding for reconsideration.[64] EPA then issued its first administrative, three-month stay of the rule, which the U.S. Court of Appeals for the District of Columbia Circuit summarily vacated as unlawful.[65] EPA again attempted to halt implementation of the 2016 Standard by proposing two additional stays of the requirements. Several commenters, including the States and Cities, opposed EPA's proposed stays, and the action was never finalized. In October 2018, EPA also proposed amendments to the 2016 Standard, which have not yet been finalized. Therefore, the 2016 Standard, and the statutory requirement to promulgate guidelines to address methane emissions from existing sources, continues in full force and effect.

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[57] *Notice Regarding Withdrawal of Obligation to Submit Information; Notice*, 82 Fed. Reg. 12,817 (Mar. 7, 2017).
[58] Senior career staff "most familiar with the circumstances surrounding the ICR withdrawal," "did not discuss the ICR withdrawal at any time with Mr. Pruitt," nor "with any outside parties," and did not "bec[o]me aware of the basis for the withdrawal of the 2016 ICR [until] March 2, 2017," the day it was signed. *See* Attachment 8, EPA's Amended Responses to Plaintiffs' First Set of Interrogatories at 4–7.
[59] See Attachment 9 (Declaration of Morgan Costello).
[60] *Id.*
[61] 82 Fed. Reg. 16,093 (Mar. 31, 2017)
[62] *Id.* § 1(c).
[63] 82 Fed. Reg. 16,331 (Apr. 4, 2017)
[64] *See* Letter re: Convening a Proceeding for Reconsideration of Final Rule, "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed and Modified Sources," published June 3, 2016, to Counsel for Entities that Petitioned for reconsideration, available at (Apr. 18, 2017), *available at* https://www.epa.gov/sites/production/files/2017-04/documents/oil_and_gas_fugitive_emissions_monitoring_reconsideration_4_18_2017.pdf.
[65] *Clean Air Council v. Pruitt*, 862 F.3d 1, 14 (D.C. Cir. 2017).

The Proposed Rule is the latest in a series of attempts by EPA to undermine a common-sense rule that reduces emissions of harmful pollutants and recovers valuable natural gas that would otherwise be lost.[66] EPA admits that the Proposed Rule will increase methane emissions by 370,000 tons, VOC emissions by about 10,000 tons, and hazardous air pollutants by about 300 tons between 2019 and 2025 as compared to the 2016 Standard.[67] At base, EPA proposes to rescind the regulation of methane from the 2016 Standard.[68] EPA further proposes to revise the source category to remove the transmission and storage segment from the 2016 Standard. EPA also seeks comment on proposed "alternative interpretations of its statutory authority" to regulate pollutants under section 111 of the Clean Air Act.[69] Specifically, EPA takes comment on whether "the Agency is required to make a significant-contribution finding each time that it regulates a pollutant from the source category."[70] EPA points to the Executive Order No. 13783 ("Order") as the basis for this proposal.[71] But an Executive Order cannot relieve EPA from its statutory obligations to regulate methane emissions from the oil and natural gas source category.

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[66] The Proposed Rule has already been met with widespread opposition from a range of stakeholders, including major oil companies like Exxon Mobil Corp., BP PLC, and Royal Dutch Shell PLC. *See, e.g.*, https://www.reuters.com/article/us-ceraweek-energy-emissions/shell-urges-trump-white-house-to-tighten-methane-leak-rules-idUSKBN1QT2DT; https://www.houstonchronicle.com/opinion/outlook/article/BP-America-chief-It-s-time-for-the-Trump-13721656.php; https://energyfactor.exxonmobil.com/perspectives/supports-methane-regulation/; https://www.shell.com/sustainability/transparency/public-advocacy-and-political-activity/_jcr_content/par/textimage.stream/1554466210642/0a46ab13e36e99f8762ebb021bd72decec2f47b2/final-industry-association-climate-review-april-2019.pdf. This position is shared by other key stakeholders, including major downstream utilities (natural gas users) and investors. *See, e.g.*, http://business.edf.org/blog/2019/10/09/federal-methane-rollbacks-spark-new-opposition-from-12-major-utilities.

[67] *See* 84 Fed. Reg. at 50,278.

[68] *See* 84 Fed. Reg. at 50,246. But events predating the March 2017 Executive Order appear to support a pretextual rationale for the Proposed Rule. *See* Attachment 8 (EPA's Amended Responses to Plaintiffs' First Set of Interrogatories at 4–7); *see* Attachment 9 (Declaration of Morgan Costello); *see* Attachment 14, Statement of Issues filed by the American Petroleum Institute in D.C. Circuit, Case No. 16-1270. As the U.S. Supreme Court has recently made clear, "an explanation for agency action that is incongruent with what the record reveals about the agency's priorities and decisionmaking process" cannot satisfy the reasoned decision-making requirements of federal administrative law. *Dep't of Commerce v. New York*, 139 S. Ct. 2551, 2575 (2019).

[69] *Id*. at 50,244.

[70] *Id*. at 50,246.

[71] 84 Fed. Reg. at 50,246.

The Order also specifically states that it "shall be implemented consistent with applicable law,"[72] and as detailed below, the Proposed Rule is not consistent with applicable law.

II. EPA's Proposed Rule Is Unlawful and Arbitrary and Capricious

Under the Clean Air Act, an EPA rulemaking will be set aside if it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 42 U.S.C. § 7607(d)(9)(A); *see also Ethyl Corp. v. EPA*, 51 F.3d 1053, 1064 (D.C. Cir. 995) (arbitrary and capricious standard under the Clean Air Act is interpreted in "essentially the same" way as the same standard under the Administrative Procedure Act). As the Supreme Court has explained, "[o]ne of the basic procedural requirements of administrative rulemaking is that an agency must give adequate reasons for its decisions." *Encino Motorcars LLC v. Navarro*, 136 S. Ct. 2117, 2125 (2016); *see also Motor Vehicle Mfrs. Ass'n of the United States v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (an agency must "examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made.").

Because the Proposed Rule represents a change in EPA's position, EPA must display "awareness that it is changing position;" show that "the new policy is permissible under the statute"; "believe[]" the new policy is better; and provide "good reasons" for the new policy. *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009); *see also Lone Mountain Processing, Inc. v. Secretary of Labor*, 709 F.3d 1161, 1164 (D.C. Cir. 2013) ("[A]n agency changing its course must supply a reasoned analysis indicating that prior policies and standards are being deliberately changed, not casually ignored. Failing to supply such analysis renders the agency's action arbitrary and capricious."). And if the Proposed Rule rests upon factual findings that contradict a prior policy, then the agency must include "a reasoned explanation . . . for disregarding facts and circumstances that underlay or were engendered by the prior policy." *Fox*, 556 U.S. at 515-16. The Proposed Rule fails to meet this standard.

A. EPA's Proposal to Rescind Regulation of Methane from the Oil and Natural Gas Industry Is Unlawful

The Proposed Rule is arbitrary and capricious and unlawful under the Clean Air Act. Based on the extensive rulemaking record for the 2016 Standard, EPA had a rational basis to regulate methane and EPA fails to justify its change of position in light of that record. Further, the Proposed Rule violates the Clean Air Act because EPA determined that the oil and natural gas source category contributes significantly to air pollution, including GHGs, that may reasonably be anticipated to endanger public health or welfare and thus, EPA remains statutorily

[72] Executive Order No. 13783 § 8(b); *see also id.* § 1(c) (directing agencies to review existing regulations and "appropriately suspend, revise, or rescind those that unduly burden the development of domestic energy resources *beyond the degree necessary to protect the public interest or otherwise to comply with the law*." (emphasis added)).

obligated to regulate methane emissions from this source. The Proposed Rule is also unlawful because it would remove the transmission and storage segment from the source category without reconciling the revision with EPA's prior endangerment and significant contribution finding or EPA's prior interpretation of the original listing. Finally, the Proposed Rule is arbitrary and capricious because EPA fails to adequately consider the implications of its action on existing sources in the oil and natural gas industry and disregards EPA's prior position without any reasoned explanation.

1. EPA Had a Rational Basis to Regulate Methane, and the Proposed Rule is Arbitrary and Capricious for Failing to Justify EPA's Reversal

EPA fails to justify its change of position from the 2016 Standard or reconcile the Proposed Rule with its own rulemaking record. In 2016, EPA finalized its alternative proposal to revise the source category to broadly cover all components of the oil and natural gas industry. See infra section __. But the primary proposal focused on EPA's authority to regulate emissions of an additional pollutant—specifically methane—from a previously listed category. Under the plain language of section 111 and EPA's longstanding interpretation, once EPA lists and regulates a source category for any pollutant, EPA does not need to make an additional endangerment finding, including a significant contribution finding, before regulating additional pollutants emitted by both new and existing sources in that source category. Instead, "[i]n exercising its discretion with respect to which pollutants are appropriate for regulation under CAA section 111(b)(1)(B), the EPA has in the past provided a rational basis for its decisions."[73] In determining whether it is appropriate to include a standard for a health-and-welfare endangering air pollutant, EPA generally considers: (i) the extent of the source category's contribution to the emissions of the pollutant, and (ii) the availability of methods to reduce those emissions.[74]

In the 2016 Standard, EPA correctly determined that it had legal authority to regulate methane from the oil and natural gas source category under section 111(b)(1)(B).[75] EPA's rational basis determination was based on overwhelming record evidence regarding the adverse impacts of methane to public health and welfare and the high quantities of methane emissions from the oil and natural gas source category, including existing sources.[76] The record before the

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[73] 81 Fed. Reg. at 35,842, citing *Nat'l. Lime Assoc. v. EPA*, 627 F. 2d 416, 426 & n.27 (D.C. Cir. 1980).

[74] *See e.g.*, 81 Fed. Reg. at 35,842; *accord* 75 Fed. Reg. 54, 970 (Sept. 9, 2010).

[75] 81 Fed. Reg. at 35,841; *id.* at 35,842-43 ("When considered in total, the facts presented in . . . this preamble, along with prior EPA analysis, . . . provide a rational basis for regulating GHG emissions from affected oil and gas sources by expressing GHG limitations in the form of limits on methane emissions.").

[76] *See, e.g.*, 81 Fed. Reg. at 35,833-43 (citing to, among other things, EPA's 2009 endangerment finding for GHGs, including methane, 74 Fed. Reg. 66,496 (Dec. 15, 2009), and subsequent

(continued…)

agency provided ample support for its authority to regulate oil and natural gas source category methane emissions under section 111(b), and there is no reason for EPA now to ignore that evidence and reach a different conclusion. Indeed, any other finding would be irrational. While administrative agencies may change their positions over time, they are required to acknowledge and explain such changes. *FCC v. Fox Television Stations, Inc*., 556 U.S. 502, 515 (2009). In particular, agencies "must show that there are good reasons for the new policy" and that "the new policy is permissible under the statute." *Id*. Further, when an agency revises a previous policy based on new data, or when the revisions would disrupt serious reliance interests, it must provide "a reasoned explanation . . . for disregarding facts and circumstances that underlay or were engendered by the prior policy." *Id*.

Here, EPA has not met any of these requirements. As discussed below, EPA has not demonstrated, and cannot demonstrate, that rescinding the methane requirements of the 2016 Standard is permissible under section 111(b) of the Clean Air Act. *See* Section II.A.2. EPA has also failed to provide good reasons supporting its new policy. EPA's stated justification for the rescission is to remove regulatory duplication because the regulatory requirements for controlling VOC emissions from new sources are "entirely redundant" of the methane requirements.[77] EPA asserts that "[i]t is rational for EPA to determine that requirements that are redundant to other requirements are not necessary because they do not result in emission reductions beyond what would otherwise occur," and proclaims that therefore the rescission "will have no impact on the amount of methane emissions."[78] However, the agency at the same time admits that its rescission of the methane requirements for *new* sources will remove its statutory obligation to promulgate non-redundant Methane Guidelines for controlling methane emissions from *existing* sources.[79] Nonetheless, EPA does not evaluate the impact of the Proposed Rule on methane emissions, nor explain how taking action to "obviate the need for the development of emission guidelines under CAA section 111(d)"[80] is consistent with its affirmative obligations under the statute to regulate emissions that it has found endanger public health and welfare.

(…continued)
assessments validating and lending additional credence to such finding; the fact that the oil and natural gas source category is the largest industrial emitter of methane in the United States; and the high global warming potential of methane, which is 28 to 36 times greater than that of carbon dioxide); *cf. Coalition for Responsible Regulation, Inc. v. EPA*, 684 F.3d 102, 120 (D.C. Cir. 2012) ("The body of scientific evidence marshaled by EPA in support of the [2009] Endangerment Finding is substantial.").
[77] 84 Fed. Reg. at 50,246.
[78] *Id.* at 50,259.
[79] *Id.* at 50,271. EPA goes so far as to "recognize" that it could just as well have rescinded the volatile organic compound regulations to eliminate this allegedly problematic redundancy (an action it admits would not eliminate its obligation to regulate methane from existing sources), but chooses to deregulate methane principally because "EPA regulated VOC first." *Id*. at 50,260.
[80] *Id*. at 50,254

Further, EPA bases its redundancy claim on the assertion that "[t]he capture and control devices that the emission sources use to meet the [2016 Standard] are the same for these co-pollutants and are not selective with respect to either VOC or methane emissions."[81] But, as EPA recognizes, future developments in leak monitoring technology may be able to speciate emissions (i.e., distinguish between methane and VOC).[82] Thus under the Proposed Rule, new technologies with that capability will not achieve the same reductions of methane as the current requirements because leaks currently subject to repair under the 2016 Standard might not be subject to repair under a VOC-only standard. While optical gas imaging (OGI) or an infrared camera is the best system of emissions monitoring for fugitive emissions from well sites and compressor stations, the 2016 Standard also allows Method 21 to be used as an alternative monitoring method to OGI and repairs must be conducted if the leak concentration level is 500 ppm or greater.[83] So if a component has a very low VOC content – such as at facilities operating in coalbed methane basins like the Raton Basin in Colorado – and a 500-ppm VOC leak concentration threshold is used, a technology that can speciate emissions may not identify it as a leak and methane reductions will be lost.

Moreover, section 111(b)(1)(B) of the Clean Air Act requires EPA periodically to reconsider and, if appropriate, revise the standards established under this section. Removing methane from the 2016 Standard will mean that the methane requirements will not be subject to this mandatory reconsideration. While similar control technologies address VOC and methane currently, it is reasonable to predict that in the future, control technologies, and thus the performance standards based on the capabilities of those technologies, could diverge. For example, control technology could improve its efficacy with respect to one, but not both, pollutants. Removing methane from the 2016 Standard means that the methane standards would not be subject to future consideration of such technological developments, and therefore, the potential for the methane standards to be strengthened would be lost by EPA's action. The eight-year review process under section 111(b)(1) itself has environmental benefit and value, which EPA has failed even to recognize, much less justify.

In a final attempt to bolster its irrational justification, EPA points to the 1977 proposed new source performance standards for Lime Plants, 42 Fed. Reg. 22,506 (May 3, 1977) ("Lime Plants NSPS") as the sole example of EPA declining to impose redundant requirements.[84] Lime plants are a source of emissions of particulate matter, nitrogen oxides, carbon monoxide, and sulfur dioxide.[85] During the rulemaking for the Lime Plants NSPS, EPA proposed and promulgated standards for particulate matter from lime plants, but declined to regulate nitrogen

[81] *Id*. at 50,259.
[82] *Id*. at 50,260.
[83] 81 Fed. Reg. at 35,857; 40 C.F.R. §60.5397a.
[84] 84 Fed. Reg. at 50,259.
[85] 42 Fed. Reg. at 22,507.

oxides, carbon monoxide, and sulfur dioxide.[86] EPA decided not to regulate nitrogen oxides and carbon monoxide because lime kilns generally emit those pollutants in low concentrations, and EPA had not yet identified an achievable control technology.[87] While EPA recognized that reducing sulfur dioxide emissions was a co-benefit to controls on particulate matter emissions, EPA decided not to regulate sulfur dioxide because of "the economic impact and the associated adverse environmental impact on water pollution, solid waste disposal, and increased energy consumption [were] not considered reasonable in light of the relatively small beneficial impact on air quality."[88] Therefore, EPA determined that a standard of performance for control of sulfur dioxide was not justified.[89] But in 2016, unlike its determination in the Lime Plants NSPS, EPA expressly recognized that the oil and natural gas source category is a significant emitter of methane emissions, and identified adequately demonstrated and cost-effective technology to limit those emissions.[90] Hence, EPA's sole regulatory example falls short of providing further justification for the Proposed Rule.

In sum, EPA has not provided any "good reasons" for the Proposed Rule and entirely fails to "offer[] an explanation for its decision that runs counter to the evidence before the agency." *North Carolina v. EPA*, 531 F.3d 896, 906 (D.C. Cir. 2008) (quoting *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43.). Therefore, the Proposed Rule is arbitrary and capricious, constitutes an abuse of EPA's discretion, and must be withdrawn.

2. Section 111(b) of the Clean Air Act Requires EPA to Regulate Methane Emissions from Oil and Natural Gas Sources

EPA also has a nondiscretionary duty under Section 111(b) of the Clean Air Act to regulate methane emissions from the oil and natural gas source category. Three years ago, EPA determined that the facts in the record for the 2016 Standard were sufficient to support a section 111(b)(1)(A) endangerment and significant contribution finding. In 2016, EPA: (1) revised the oil and natural gas source category to include production, processing, transmission, and storage;[91] and (2) concluded that the oil and natural gas source category—including existing sources

[86] *Id.*
[87] *Id.*
[88] *Id.*
[89] *Id.*; *accord* 75 Fed. Reg. 54,970, 54,997 (Sep. 9, 2010) (EPA has "historically declined to propose standards for a pollutant where it is emitting [sic] in low amounts or where we determined that a [control analysis] would result in no control" device being used.).
[90] 81 Fed. Reg. at 35,842, 35,827; *see also* 80 Fed. Reg. at 56,595.
[91] EPA stated that the source category as listed in 1979 included oil and natural gas production, processing, transmission and storage, and, "to the extent that there is any ambiguity" in the 1979 listing, revised it to include oil and natural gas production, processing, transmission and storage. *Id*. at 35,832-35,833.

within the category—contributes significantly to air pollution that may reasonably be anticipated to endanger public health or welfare.[92]

EPA also explicitly made an endangerment and significant contribution finding with respect to GHG emissions from the oil and natural gas source category. In the 2016 Standard, EPA stated, "the oil and natural gas industry is the largest emitter of methane," "the current methane emissions from this industry contribute substantially to nationwide GHG emissions," and "ranking U.S. emissions of GHGs from oil and natural gas production and natural gas processing and transmission against total GHG emissions for entire countries . . . these emissions would be more than the national-level emissions totals for all anthropogenic sources for Greece, the Czech Republic, Chile, Belgium, and about 140 other countries."[93] EPA further found that "these emissions are expected to increase as a result of the rapid growth of this industry."[94]

In light of the significant contribution of methane emissions from the oil and natural gas source category, which EPA determined to endanger public health and welfare, EPA properly concluded that methane emissions must be directly addressed through standards of performance under section 111(b)(1).[95] Accordingly, in 2016, EPA finalized standards "based on our determination of the best system of reducing emissions of greenhouse gases (GHGs), specifically methane . . . across a variety of additional emission sources in the oil and natural gas source category (i.e., production, processing, transmission, and storage).[96] EPA compiled a robust administrative record demonstrating that the 2016 Standard met the best system of emission reductions under section 111(b), including "the amount of the pollutant that is being emitted from the source category, the availability of technically feasible control options, and the costs of those control options."[97] EPA further stated, "[s]uch standards, which would be reviewed and, if appropriate, revised at least every eight years, would achieve meaningful methane reductions and, as such, would be an important step towards mitigating the impact of GHG emissions on climate change."

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[92] 81 Fed. Reg. at 35,840 (concluding that the listed oil and natural gas source category, which "includes oil and natural gas production, processing, transmission, and storage," "contributes significantly to air pollution that may reasonably be anticipated to endanger public health or welfare"); *id.* at 35,833 ("[P]ursuant to section 111(b)(1)(A), the Administrator hereby determines that, in her judgment, this source category, as defined above, contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare.").
[93] *Id.* at 35,839-40.
[94] *Id.* at 35,841.
[95] *Id.*
[96] 81 Fed. Reg. at 35,824, 35,825.
[97] See 80 Fed. Reg. at 56,593, 56,595, 56,610, 56,613-14, 56,616-45 (proposed rule); 81 Fed. Reg. at 35,826-27, 35,829, 35,842, 35,845-46, 35,852, 35,855-56, 35,862, 35,871, 35,878-79, 35,891 (final rule).

Given its determinations in 2016, EPA is no longer writing on a blank slate. The Proposed Rule does not revisit the endangerment finding for GHGs. Nor does it contend that the oil and natural gas source category does not significantly contribute GHGs. Nor does it allege (or cite data to suggest) that the 2016 Standard is no longer achievable, adequately demonstrated, or represent the best system of emission reductions for the oil and natural gas source category. Thus, EPA remains statutorily obligated under section 111(b) of the Clean Air Act to regulate methane emissions from the oil and natural gas source category.

Although EPA may change its policy with respect to *how* to regulate methane emissions from the oil and natural gas source category (assuming that new policy is lawful and well-supported by factual findings and legal analysis), it cannot simply announce a policy of non-regulation now that it has made such findings. *See FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009) (A "new policy" by an agency must be "permissible under the statute."); see also *NRDC v. Daley*, 209 F.3d 747, 755-56 (D.C. Cir. 2000) (holding agency acted arbitrarily for failing to provide "reasoned analysis to cogently explain why its proposal satisfies the [Clean Air Act's] requirements."). Accordingly, EPA's proposal contravenes section 111(b) of the Clean Air Act and EPA does not have the authority to rescind all methane standards for the oil and natural gas source category.

B. EPA's Proposal to Remove Transmission and Storage from the Source Category Is Unlawful and Arbitrary and Capricious

EPA further proposes to remove the transmission and storage segment entirely from the oil and natural gas source category and rescind the requirements of the 2016 Standard applicable to sources within the transmission and storage segment.[98] Under this proposal, the following emission points from the transportation and storage sector would be exempted from regulation under the 2016 Standard: fugitive emission points, pneumatic controllers, reciprocating and centrifugal compressors, and professional engineer certification for closed vent systems.[99] EPA admits that this would result in a significant increase in emissions of methane, VOCs, and hazardous air pollutants.[100] But EPA fails to explain how this proposed source category revision is lawful under section 111(b) of the Clean Air Act. As discussed above, in 2016 EPA determined that the rulemaking record supported a revision of the source category listing to broadly include the oil and natural gas industry (i.e., production, processing, transmission, and storage) that, in the Administrator's judgment, contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. EPA does not reconcile the Proposed Rule with its prior determinations in 2016—specifically, EPA fails to justify its decision to revise the source category to increase emissions of air pollution in direct contravention of EPA's prior endangerment and significant contribution finding under section 111(b) of the Clean Air Act.

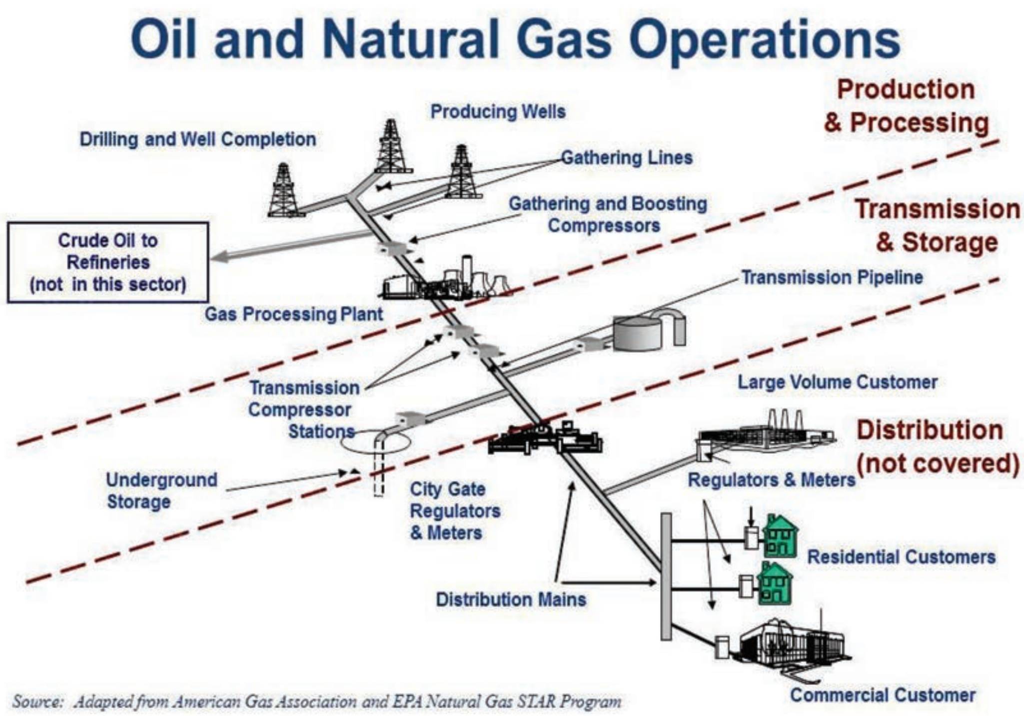
[98] 84 Fed. Reg. at 50,254.
[99] RIA at 2-1 to 2-4.
[100] 84 Fed. Reg. at 50,278.

EPA's proposal to remove transmission and storage is also arbitrary and capricious because EPA reasonably interpreted the 1979 listing of the oil and natural gas source category to broadly cover the natural gas industry:

> [T]he priority list analysis indicated that the EPA evaluated emissions from various segments of the natural gas industry, such as production and processing. The analysis also showed that the EPA evaluated equipment, such as stationary pipeline compressor engines that are used in various segments of the natural gas industry.[101]

Also, when issuing the first sets of standards of performance for this source category in 1984, EPA described the major emission points to include process, storage, and equipment leaks, which can be found throughout the various segments of the natural gas industry.[102] In subsequent agency rulemaking, EPA has interpreted the 1979 listing broadly as creating a source category for the entire oil and natural gas industry.[103] As EPA noted in 2016 and as illustrated in the diagram below, "[t]here are also good reasons for treating various segments of the natural gas industry as one source category" because they "are all important aspects of the natural gas cycle – the process of getting natural gas out of the ground and to the end user."[104]

[101] 81 Fed. Reg. at 35,832.
[102] *See* 49 Fed. Reg. 2,696, 2,637 (Jan. 20, 1984) (the source "encompass[es] the operations of exploring for crude oil and natural gas products, drilling for these products, removing them from beneath the earth's surface, and processing these products from oil and gas fields for distribution to petroleum refineries and gas pipelines").
[103] *See* 81 Fed. Reg. at 35,832 ("Specifically, with respect to the natural gas industry, it includes production, processing, transmission, and storage."); 76 Fed. Reg. at 52,738 ("Specifically for oil, the sector includes all operations from the well to the point of custody transfer at a petroleum refinery. For natural gas, the sector includes all operations from the well to the customer."); 77 Fed. Reg. at 49, 514.
[104] 81 Fed. Reg. at 35,832; *ibid* ("Operations at production, processing, transmission and storage facilities are a sequence of functions that are interrelated and necessary for getting the recovered gas ready for distribution.")



EPA cited the increase in natural gas production from hydraulic fracturing and horizontal drilling as an example of the interrelated nature of the industry—i.e., increased production resulting in an increase in the amount of natural gas needing to be processed and moved to market or stored, which in turn results in increases in emissions across the entire natural gas industry.[105] EPA further noted that "equipment (e.g., storage vessels, compressors) are used across the oil and natural gas industry," only lending additional support for "considering the industry as one source category."[106] Indeed, because the transmission and storage segment uses the same equipment as the production and processing segment and emits the same pollutants, EPA determined in the 2016 Standard that the same control technologies and practices can be used to control their emissions.[107]

Now, EPA claims that operations of the transmission and storage segment are not related to production and processing "because the natural gas that enters the transmission and storage segment has different composition and characteristics than the natural gas that enters the

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105 *Id.*
106 *Id.*
107 81 Fed. Reg. at 35,828.

production and processing segments."[108] EPA's claim is a distinction without a difference. To support its assertion, EPA compares the average composition of the production segment to the average composition of the transmission segment.[109] But, EPA fails to discuss its own data, indicating a wide range of natural gas composition across the entire sector. For example, according to 2011 data from EPA, the methane content of the natural gas in the production sector ranged from 65.7% to 97.2%, and in the transmission sector, it ranged from 91.9% to 95.2%.[110] Likewise, VOC content of the natural gas in the production sector ranged from 1.2% to 5.7% compared to 0.2 to 6.8% in the transmission sector.[111] EPA's more recent data submitted in support of the Proposed Rule only confirms its 2011 data, with methane content in natural gas from the production segment ranging from 17.5% to 98.4% and VOC content ranging from 0% to 40.9%.[112] Thus, EPA's own data, does not support EPA's contention that the composition of natural gas in the production sector differs so fundamentally from gas in the transmission sector as to justify removing the transmission and storage segment from the oil and natural gas source category.

For these reasons, EPA's proposal to revise the oil and natural gas source category is unlawful. EPA has not provided "a reasoned explanation . . . for disregarding facts and circumstances that underlay" EPA's prior determination that the oil and natural gas source category includes the transmission and storage segment. *Fox*, 556 U.S. at 515-16. The Proposed Rule is therefore arbitrary and capricious, constitutes and abuse of EPA's discretion, and must be withdrawn.

C. EPA's Failure to Adequately Consider the Implications of its Action on Existing Sources Is Unlawful and Arbitrary and Capricious

EPA's proposal to rescind methane standards for all new sources in the oil and natural gas sector under section 111(b) of the Act is a transparent attempt to avoid EPA's concomitant statutory obligation under section 111(d) to promulgate emission guidelines for existing sources in that sector. Methane emissions from existing oil and natural gas sources constitute the majority of methane emissions from the oil and natural gas sector in the United States,[113] which

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[108] 84 Fed. Reg. at 50,257.
[109] *Id.* at 50,258.
[110] Composition of Natural Gas for Use in the Oil and Natural Gas Sector Rulemaking, July 28, 2011.
[111] *Id.*
[112] Natural Gas Composition, November 13, 2018.
[113] Methane emissions from oil and natural gas sources in existence before 2012 constitute the majority of methane emissions from the oil and natural gas sector in the United States. *See* ICF Int'l, Economic Analysis of Methane Emission Reduction Opportunities in the U.S. Onshore Oil and Natural Gas Industries 1 (2014), *available at* http://www.edf.org/sites/default/files/methane_cost_curve_report.pdf.

in turn is the largest industrial emitter of methane in the United States.[114] EPA's stated rationale that new source methane standards are entirely redundant with the requirements for controlling VOC emissions, such that the rescission "will have no impact on the amount of methane emissions,"[115] fails to consider the entirely non-redundant effect of EPA's proposal on the lack of control of the vast majority of methane emissions (and emissions of other harmful pollutants) from existing oil and natural gas sources. Although EPA admits that its proposal will remove its statutory obligation to promulgate methane guidelines for controlling methane emissions from existing sources,[116] it fails to adequately or rationally analyze and account for the effect of its proposal. Because rescission of the new source methane standards will result in a continuing absence of requirements for control of emissions from existing sources that EPA was required to develop contemporaneously with the new source standards, the new source standards cannot fairly be characterized as redundant. EPA's Proposed Rule violates its statutory obligation under section 111(d) of the Clean Air Act, the requirements of section 307(d) of the Act, and principles of rational agency rulemaking.

1. EPA's Proposal Violates Clean Air Act Section 111(d).

For the reasons explained above, EPA's proposal to deregulate methane emissions from new and modified oil and natural gas sources contravenes its statutory obligation under section 111(b) of the Clean Air Act. Similarly, EPA's proposal to deregulate methane and thereby "obviate the need for" EPA to develop emission guidelines for regulating methane emissions from existing sources violates section 111(d) of the Act. Now that EPA has regulated oil and natural gas sector methane emissions under 111(b), it cannot lawfully avoid its obligation to regulate existing sources under 111(d) simply by getting rid of the 111(b) regulation.

In the 2016 Standard, in addition to finding a rational basis for concluding that methane emissions from the oil and natural gas source category merits regulation under section 111, EPA also made a pollutant specific endangerment and significant contribution finding for methane emissions from the oil and natural gas category, including existing sources within such category. Both EPA's rational basis and endangerment/significant contribution determinations were based on overwhelming record evidence regarding the adverse impacts of methane to public health and welfare and the high quantities of methane emissions from the oil and natural gas source category, *including existing sources*.[117] That evidence and additional evidence submitted to the record of this proposed rulemaking could not support a contrary finding.

[114] *See* 81 Fed. Reg. at 35,842.
[115] 84 Fed. Reg. at 50,259
[116] *Id.* at 50,271.
[117] *See, e.g.*, 81 Fed. Reg. at 35,833-43 (citing to, among other things, EPA's 2009 endangerment finding for GHGs, including methane, 74 Fed. Reg. 66,496 (Dec. 15, 2009), and subsequent assessments validating and lending additional credence to such finding; the fact that the oil and natural gas source category is the largest industrial emitter of methane in the United States; and the high global warming potential of methane, which is 28 to 36 times greater than that of CO_2).

The Supreme Court held more than ten years ago that "[i]f EPA makes a finding of endangerment, the Clean Air Act requires the Agency to regulate emissions of the dangerous pollutant." *Massachusetts v. EPA*, 549 U.S. 497, 533 (2007). According to the Court, "[u]nder the clear terms of the Clean Air Act, EPA can avoid taking further action only if it determines that greenhouse gases do not contribute to climate change or if it provides some reasonable explanation as to why it cannot or will not exercise its discretion to determine whether they do." *Id.* As two D.C. Circuit judges recognized in the context of EPA's obligation to regulate GHG emissions from existing power plants under section 111(d) of the Clean Air Act, EPA's 2009 endangerment finding "triggered an affirmative statutory obligation to regulate [GHGs]." Per Curiam Order, *West Virginia v. EPA*, D.C. Cir. No. 15-1363 (Aug. 8, 2017) (Tatel, Millett, concurring); *see also Am. Elec. Power Co. v. Connecticut*, 564 U.S. 410, 426-427 (2011) (Clean Air Act "directs the EPA to establish emissions standards for categories of stationary sources" where pollution from those sources endangers public health or welfare).

EPA's 2009 endangerment finding for GHGs and its 2016 rational basis determination and pollutant-specific endangerment/significant contribution finding for methane emissions from the oil and natural gas source category statutorily obligate EPA to regulate such emissions not just from new sources under section 111(b), but also from existing sources under section 111(d). EPA's proposal to deregulate methane entirely from the oil and natural gas source category without any affirmative determination that such emissions do not endanger public health and welfare or that the oil and natural gas sector does not significantly contribute to such endangerment is not permissible under section 111(d) of the Act.

2. EPA's Proposal Violates Clean Air Act Section 307(d).

The Proposed Rule's discussion of the implications of deregulating methane fails to meet the requirements of section 307(d) of the Clean Air Act in several respects. Section 307 mandates that, *in a proposed rule itself*, EPA must provide the public with the "factual data on which the proposed rule is based," and "the methodology used in obtaining the data and in analyzing the data."[118] The Act also mandates that "[a]ll data, information, and documents referred to in this paragraph on which the proposed rule relies shall be included in the docket *on the date of publication of the proposed rule*."[119] Thus, "the comments of other interested parties do not satisfy an agency's obligation to provide notice." *Nat'l Black Media Coal. v. FCC*, 791 F.2d 1016, 1023 (D.C. Cir. 1986).

Notice and comment rulemaking requires an agency to disclose the bases for its proposed regulations, and "serves three distinct purposes." *Small Refiner Lead Phase-Down Task Force v. EPA*, 705 F.2d 506, 547 (D.C. Cir. 1983). These include "(1) to ensure that agency regulations are tested via exposure to diverse public comment, (2) to ensure fairness to affected parties, and

[118] 42 U.S.C. § 7607(d)(3).
[119] *Id.* § 7607(d)(3) (emphasis added).

(3) to give affected parties an opportunity to develop evidence in the record to support their objections to the rule and thereby enhance the quality of judicial review." *Am. Coke & Coal Chems. Inst. v. EPA*, 452 F.3d 930, 938 (D.C. Cir. 2007); *Util. Solid Waste Activities Grp. v. EPA*, 901 F.3d 414, 442 (D.C. Cir. 2018). The public can only meaningfully analyze and comment on a proposed rule if it has the data supporting the proposed rule. *See Prometheus Radio Project v. FCC*, 652 F.3d 431, 450 (3d Cir. 2011) ("The opportunity for comment must be a meaningful opportunity. That means enough time with enough information to comment and for the agency to consider and respond to the comments." (citing *Rural Cellular Ass'n v. FCC*, 588 F.3d 1095, 1101 (D.C. Cir. 2009))). Congress enacted section 307(d) of the Clean Air Act to provide for even more rigorous requirements than under the Administrative Procedure Act (APA) to ensure that the public and regulated community will have an adequate basis on which to comment on EPA proposals. *See, e.g.*, *Schiller v. Tower Semiconductor, Ltd.*, 449 F.3d 286, 300 n.14 (2d Cir. 2006) (explaining that in section 307(d) Congress provided specific procedures for notice and comment that go beyond what is required under the APA).

EPA cannot make a proposal and solicit data to support that proposal through comments, as it appears to be doing here. Rather than providing the required data and analysis to support its proposal, EPA is apparently using the proposal as an opportunity to solicit data and information that it currently lacks to support a pre-determined policy preference. The proper order of steps under the Act is to gather the data that allegedly supports the proposal *first* and then make that data available for comment through a proposal. Here, to the extent the Administrator gathered or gathers any data at all to support his preferred policy outcome, it does not appear that the public will ever be allowed to comment on that data, undermining the entire purpose of notice and comment. *See Small Refiner*, 705 F.2d at 549-50 ("EPA must *itself* provide notice of a regulatory proposal. Having failed to do so, it cannot bootstrap notice from a comment."); *see Costle*, 657 F.2d at 398 (public must be able to meaningfully comment on factual underpinnings of a rule).

EPA claims that the lack of regulation of existing sources "will" have a limited impact and then presents several speculative hypotheses and "uncertainties," rather than factual data, as to why that "may" be so. [120] EPA then solicits data and other factual information through the rulemaking to support its conclusion. Section 307(d) of the Clean Air Act, 42 U.S.C. § 7607(d)(3), does not permit this. If EPA seeks to obtain factual data to support its desired policy ends, the Clean Air Act provides a different tool for that: a section 114 information collection request.[121]

Should EPA gather data through this proposal and then seek to rely upon it, EPA may not finalize the Proposed Rule, but must instead make that data available to the public for comment

[120] *See* 84 Fed. Reg. at 50,273-74.
[121] *See id.* § 7414 ("For the purpose of (i) developing or assisting the development of . . . any performance standard under section 7411 of this title . . . (1) the Administrator may require any person who owns or operates any emission source" to provide information).

through a new proposed rule. *See, e.g., American Medical Ass'n v. Reno*, 57 F.3d 1129, 1133 (D.C. Cir. 1995); *Connecticut Light & Power Co. v. NRC*, 673 F.2d 525, 530-31 (D.C. Cir. 1982) ("An agency commits serious procedural error when it fails to reveal portions of the technical basis for a proposed rule in time to allow for meaningful commentary."); *Kennecott Corp. v. EPA,* 684 F.2d 1007, 1018 (D.C. Cir. 1982) (setting aside regulation where agency had not provided underlying factual data in proposed rule); *Daimler Trucks N. Am. LLC v. EPA*, 737 F.3d 95 (D.C. Cir. 2013) (setting aside EPA rule for failure to provide adequate notice and comment); *Sierra Club v. Costle*, 657 F.2d 298, 398 (D.C. Cir. 1981) ("If, however, documents of central importance upon which EPA intended to rely had been entered on the docket too late for any meaningful public comment prior to promulgation, then both the structure and spirit of section 307 would have been violated.").

EPA's discussion of the purported limited impact of lack of regulation of existing sources under section 111(d) from its proposal to rescind methane regulation for new sources is replete with examples of EPA using the proposal to collect supportive information instead of including supporting factual data in violation of section 307(d). For example:

- *EPA is requesting data and information to support its claim that existing sources will retire or will become subject to the existing NSPS regulations because they will undertake modification or reconstruction.*

EPA speculates that methane emissions from existing sources will decline despite its proposed deregulation because existing sources "will" be replaced by new facilities, undertake modifications, or shut down.[122] Yet EPA then admits that it currently lacks sufficient information and analysis to support this claim and solicits information and data to help determine the rate of turnover of existing facilities.[123] EPA says that it is "in the process" of examining the rate of turnover and has reviewed indirect turnover information from three sources: Greenhouse Gas Inventory ("GHGI") activity counts for pneumatic controllers, compressors, storage vessels, and well completions; DrillingInfo for well completions; and compliance reports submitted under the 2016 Standard for the first reported compliance year. At most, EPA states that this information "may be indicative of trends for some sources whereas, for other sources, no conclusions can yet be drawn."[124]

With respect to the first two sources of information (GHGI and DrillingInfo), EPA admits to the "uncertainty in data" from the source and says that it "will need additional information to assess the identified gaps for purposes of identifying trends."[125] EPA "solicits information and data to help evaluate the rate at which existing sources decline over time, through modification,

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[122] 84 Fed. Reg. at 50,271.
[123] *Id.* at 50,273-74.
[124] *Id.* at 50,273.
[125] *Id.* at 50,273, n.90 & 91.

obsolescence, shutdown, replacement to new source status or otherwise."[126] With respect to compliance reports, EPA states that "due to various uncertainties, we are unable to develop a rate at which existing sources become subject to the [2016 Standard]."[127] EPA solicits comment on "ways to use this information to predict turnover trends."[128]

EPA also purports to have reviewed "all [2016 Standard] compliance reports that had been submitted to the Agency through November 21, 2017."[129] However, EPA has no way to verify whether all sources that are "subject to regulation" under the 2016 Standard are in fact complying. In litigation over EPA's unreasonable delay in promulgating emission guidelines for methane emissions from existing oil and natural gas sources, EPA represented that it has no centralized internal mechanism to track compliance reports that are submitted to EPA's regional offices, in paper or electronic form, outside of EPA's Compliance and Emissions Data Reporting Interface (CEDRI).[130] Similarly, EPA possesses directly relevant data submitted to the agency by the regulated facilities that the agency has failed to reference. This includes, but is not limited to, annual compliance reports submitted after November 21, 2017, and information submitted in response to the information collection request (Methane ICR) that EPA issued to obtain "more specific information that would be of critical use in addressing existing source emissions pursuant to CAA section 111(d)."[131] EPA issued the Methane ICR on November 10, 2016 and began receiving the requested information from oil and natural gas operators in January 2017. Yet EPA does not acknowledge the existence of this data or include it in the rulemaking record as required under section 307(b). The undersigned hereby request that EPA include this data in the rulemaking record.

Further, as stated, EPA abruptly withdrew the Methane ICR in March 2017 without any notice or opportunity to comment, purportedly "to assess the need for the information that the agency was collecting."[132] EPA never issued any follow-up ICR or endeavored to collect this information. Much of the data and information that EPA now seeks in the proposal regarding turnover of existing sources would have been collected through the withdrawn Methane ICR, which is the proper mechanism to collect the data necessary to inform any proposal under section 111.

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[126] *Id.* at 50,273; *see also id.* at 50,273-74 (also soliciting specific data and information on the turnover rate of pneumatic controllers, wet seal centrifugal compressors, storage vessel production throughput and turnover rate, and the time period of well completions).
[127] *Id.* at 50,274.
[128] *Id.*
[129] 84 Fed. Reg. at 50,274.
[130] *See* Attachment 10, Email from Heather Gange, U.S. Dep't of Justice, to Morgan Costello, re *New York v. Wheeler*, No. 18-772—Updated EPA Response to Discovery Proposals (Apr. 25, 2019).
[131] 81 Fed. Reg, 35,763, 35,764 (June 3, 2016).
[132] 82 Fed. Reg. 12,817 (Mar. 7, 2017).

- *EPA is requesting comment to support its claim that sufficient market incentives exist to reduce methane emissions from existing sources.*

EPA claims that "existing sources already have market incentives to reduce methane emissions,"[133] but then goes on to admit that its sole source of information for such claim is data collected by the U.S. Energy Information Administration that the Government Accountability Office found to be "limited in several ways, including that the data is voluntarily and inconsistently reported."[134] EPA then "solicits comment on whether sufficient market incentives exist to offset the costs of emissions capture such that total methane emissions will trend downward under these incentives."[135]

- *EPA is requesting data and information to support its claim that participation in voluntary emission reduction programs will reduce methane emissions.*

EPA cites to participation by industry in voluntary emission reduction programs as support for its claim that lack of regulation of existing sources under section 111(d) will not mean a substantial amount of lost emission reductions. While making no effort to quantify the percentage of existing sources that participate in such programs, EPA speculates that "participation may increase over time."[136] EPA then "solicits data and information that the EPA can use to evaluate the aggregate present impact and potential future impact of oil and natural gas industry participation in voluntary programs."[137]

- *EPA is requesting comment on whether state regulatory requirements will meaningfully reduce methane emissions.*

EPA claims that existing sources "in many cases are subject to state requirements" to reduce methane emissions.[138] EPA lists a handful of states that have established regulations on oil and natural gas sector emissions, but does not differentiate which states cover existing sources versus solely new sources. EPA makes no effort to quantify existing sources subject to state methane emission reduction requirements or to quantify the expected emission reductions from such requirements. EPA even admits that it "does not current[sic] have the capability to produce state-level projections of sources in transmission and storage that are potentially affected by this action" and is "unable to perform any quantitative analysis of state programs with similar requirements."[139] EPA solicits comment on "whether there are enough consistent state

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[133] 84 Fed. Reg. at 50,271.
[134] *Id.* at 50,275.
[135] *Id.* at 50,276.
[136] *Id.* at 50,277.
[137] *Id.*
[138] *Id.* at 50,271.
[139] *Id.*

requirements in place that will meaningfully reduce emissions should the primary proposal be finalized."[140]

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Should EPA wish to rely on any of the data or information that is has solicited through the Proposed Rule, it may not finalize the Proposed Rule without making that data and information available for public comment. In the absence of such data, commenters cannot meaningfully comment on the "uncertainties" or gaps in information identified by EPA that have no basis in fact. They cannot perform analysis on or refute the facts; in other words, their ability to "develop evidence in the record to support their objections to the rule" is severely hampered. *Int'l Union, United Mine Workers of Am.*, 407 F.3d at 1259. This undermines the entire purpose of the Clean Air Act's requirements for notice and comment. *See Am. Coke & Coal Chems. Inst.*, 452 F.3d at 938.

3. EPA's Assertion Regarding the Limited Impact of Lack of Regulation of Existing Sources Is Arbitrary and Capricious, Not Supported by Record Evidence, and Unreasonably Disregards EPA's Prior Position Without Any Reasoned Explanation.

EPA's speculative assertion, without sufficient supporting data or analysis, that the lack of regulation of existing sources directly caused by the Proposed Rule to deregulate methane emissions from new sources will have "limited impact" is quintessentially arbitrary and capricious agency action. *See State Farm*, 463 U.S. at 43; *Fox Television Stations*, 556 U.S. at 515-16. EPA's Proposal entirely fails to consider an important aspect of the problem. EPA's Proposal ignores the fact that the lion's share of methane emissions from the oil and natural gas source category, which EPA has already determined cause or contribute significantly endangerment of public health and welfare, comes from existing sources. For example, EPA proposes to determine that EPA lacked a rational basis to establish the 2016 Standard for methane emissions from the production and processing segments because those requirements are "entirely redundant" with the 2016 Standard for VOC.[141] However, EPA's rational basis for concluding in the 2016 Standard that methane from the oil and natural gas source category merits regulation under section 111 was based on its consideration of methane emissions from the *entire* source category, including from existing sources.[142] Regulation of such emissions under section

[140] *Id.*
[141] 84 Fed. Reg. at 50,259.
[142] *See* 81 Fed. Reg. at 35,838-39, tbls. 4 & 5 (quantifying total methane emissions from the oil and natural gas source category); 35,842 (stating that, in making its rational basis determination, "EPA focuses on methane emissions from this category" and citing to Tables 4 and 5). More recent peer-reviewed scientific studies have found that the United States oil and natural gas industry emits even more than EPA's prior estimates suggest. *See, e.g.*, Alvarez et al., *Assessment of methane emissions from the U.S. oil and gas supply chain*, 361(6398) Science,
(continued…)

111(d) is not in the least redundant of any current regulation of other pollutants under section 111(b). Nonetheless, EPA fails to undertake any quantitative assessment of existing source methane pollution or the foregone benefits of establishing existing source emissions guidelines.

EPA's unsupported assertions are also counter to the evidence before the agency. EPA's failure to issue guidelines for regulation of existing oil and natural gas sources has in fact resulted, and will continue to result, in substantial additional emissions of methane and other harmful pollutants to the significant harm to public health and welfare. Over the at least three-year period of EPA's delay in issuing mandatory guidelines since promulgating the 2016 Standard, existing oil and natural gas sources have emitted a massive amount of methane: over 33 million metric tons of methane, equivalent to the climate impact of over 600 million passenger vehicles driven for one year.[143] If EPA had issued methane guidelines for existing sources identical to the 2016 Standard simultaneously with the issuance of that rule, 12.2 million tons—37 percent—of that methane pollution would have been prevented.[144] Substantial pollution will continue to occur if EPA fails to adopt methane guidelines—allowing well over 3 million metric tons of methane pollution that could otherwise be eliminated each year.[145]

These excess methane emissions are causing and will continue to cause significant environmental impacts. Methane emissions significantly contribute to pollution that causes climate change. *Massachusetts v. EPA*, 549 U.S. at 521. A dire report released a year ago by the Intergovernmental Panel on Climate Change highlights the immediate and pressing need to curb pollutants like methane in the short term to avoid the most devastating effects of climate change.[146] The additional methane emissions that have resulted and will result from EPA's failure to promulgate methane guidelines increase the likelihood of greater harms from climate change. These harms include increased heat-related deaths, damaged or lost coastal areas due to sea level rise and coastal flooding, disrupted ecosystems, more severe weather events, and longer and more frequent droughts. These and other climate change harms were confirmed in the Assessment, a 2018 report issued by EPA itself and other government agencies.[147] Rapid reductions in methane emissions are critical to slowing the rate of warming and reducing the risk of the worst climate change harms. EPA's speculation that lack of existing source regulation will have a limited impact because methane emissions from existing sources may decline over

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(...continued)
186-88 (July 13, 2018) (finding that the sector emitted over 13 million metric tons of methane in 2015—60% higher than EPA's estimates).

[143] *See* Attachment 11, Declaration of Dr. Renee McVay and Hillary Hull, submitted in *New York v. EPA*, Case No. 18-cv-0773 (D.D.C.) at ¶ 11; Attachment 12, Declaration of Ilissa B. Ocko, submitted in *New York v. EPA*, Case No. 18-cv-0773 (D.D.C.) at ¶ 12.

[144] *See* Attachment 11, McVay/Hull Decl. at ¶ 11.

[145] *See id.* at ¶ 12.

[146] IPCC, *Global Warming of 1.5°C – Summary for Policymakers* (2018), *available at* http://www.ipcc.ch.

[147] Assessment, Chapters 18-27 (2018).

some unspecified future time ignores the critical need to obtain the necessary immediate and substantial emission reductions.

EPA's specific claims that eliminating methane regulation from new and modified oil and natural gas facilities will not result in a substantial amount of lost emission reductions because equipment turnover, market incentives, voluntary actions, and state regulations will address the problem are similarly unsupported by any reasoned analysis, contrary to the evidence before the agency, and inconsistent with findings EPA itself made in prior rulemakings, including the 2016 Standard. EPA has provided no rational basis for its drastic shift in position. *See Lone Mountain Processing, Inc. v. Secretary of Labor*, 709 F.3d 1161, 1164 (D.C. Cir. 2013) ("[A]n agency changing its course must supply a reasoned analysis indicating that prior policies and standards are being deliberately changed, not casually ignored. Failing to supply such analysis renders the agency's action arbitrary and capricious"). More specifically:

- *EPA's claims regarding equipment turnover are unsupported and thus arbitrary and capricious.*

As discussed above, EPA not only fails to substantiate its "belie[f]" that "it is reasonable to expect that the number of existing sources may decline over time due to obsolescence or to shut down and removal actions" but specifically solicits comment to support its conjecture.[148] Indeed, EPA's perfunctory review only serves to reveal its uncertainty.[149] Given that EPA abruptly withdrew the Methane ICR it had issued to obtain "more specific information that would be of critical use in addressing existing source emissions pursuant to CAA section 111(d),"[150] EPA lacks the necessary information that could support a reasoned analysis and thus its action is arbitrary and capricious. *Encino*, 136 S. Ct. at 2125.

- *EPA's claim regarding market incentives is arbitrary and capricious.*

EPA also argues that "operators have market incentives to reduce emissions and the loss of valuable product to the atmosphere," despite relying on data that is "voluntarily and inconsistently reported" to support this argument.[151] As explained in comments submitted by Catherine Hausman and Daniel Raimi from the University of Michigan, EPA's reasoning is flawed: if there is an externality associated with methane emissions, then private actors will

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[148] 84 Fed. Reg. at 50,273.
[149] *Id.* (noting that "the available information may be indicative of trends for some sources whereas, for other sources, no conclusions can yet be drawn").
[150] 81 Fed. Reg, at 35,764.
[151] 84 Fed. Reg. at 50,275.

reduce emissions at a rate that is less than optimal for society as a whole, which is precisely why EPA develops and enforces emissions regulations such as those in question.[152]

EPA's claim also runs counter to the evidence, which shows that as a result of current low natural gas prices, economic incentives are not sufficient to address the problem. *See State Farm*, 463 U.S. at 43. For example, widespread flaring of natural gas continues to occur in several of the largest oil-producing areas of the country. In fact, the practice has hit record levels as companies drill for oil in shale fields in the Permian Basin in Texas and the Bakken field in North Dakota because, according to producers, gas prices are so cheap it is not worth building pipelines to transport to market the large amounts of natural gas produced along with oil.[153] In the Permian Basin, oil companies flared 553 million cubic feet a day during the fourth quarter of 2018, which is the highest level since 2011 and more than some small states use in a year.[154] An analysis of state data in Texas shows that three of the fifteen biggest producers in the Permian Basin oil field flared more that 4% of the gas they produced in 2018, and five companies were flaring a greater percentage of their gas in 2018 than in 2016.[155] Flaring in the Permian Basin increased to an average of 661 million cubic feet of gas per day in the first quarter of 2019, more than twice the level from the first quarter of 2018 and more than the output of the biggest offshore gas field in the Gulf of Mexico.[156] Analysts further estimate that the Permian Basin will flare 1 Bcf/day (approximately .027 short ton/day equivalent) in the coming year (2019-2020).[157]

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[152] Comment submitted by Catherine Hausman, Assistant Professor, Gerald R. Ford School of Public Policy, University of Michigan and Daniel Raimi, Kleinman, Senior Research Associate, Resources for the Future, Docket ID No. EPA-HQ-OAR-2017-0757 (Oct. 16, 2019).

[153] *See* Lee, *Gas glut spurs near-record flaring across shale states*, E & E News, May 8, 2019, *available at* https://www.eenews.net/energywire/stories/1060292021/.

[154] *See* Rystad Energy, *Permian natural gas flaring exceeds 500 MMcfd in 4Q18* (Feb. 21, 2019), *available at* https://www.eenews.net/assets/2019/05/06/document_pm_02.pdf; Rystad Energy, *Permian Gas Flaring Reaches Yet Another High* (Nov. 5, 2019), *available at* https://www.rystadenergy.com/newsevents/news/press-releases/permian-gas-flaring-reaches-yet-another-high/.

[155] *See* http://blogs.edf.org/texascleanairmatters/2019/08/14/new-permian-data-show-how-worst-offenders-prevent-progress-on-flaring/?utm_source=email&utm_campaign=expert_none_upd_ngas&utm_medium=email&utm_id=1565795196&utm_content=not-vocus.

[156] Lee, *Permian Basin flaring doubles, hits record*, E & E News (June 5, 2019), *available at* https://www.eenews.net/energywire/stories/1060481837/.

[157]Davis, *Permian Natural Gas Flaring Said Likely to Hit 1 Bcf/d-Plus Until Pipeline Cavalry Arrives*, NGI (Mar. 26, 2019), *available at* 2020) https://www.naturalgasintel.com/articles/117831-permian-natural-gas-flaring-said-likely-to-hit-1-bcfd-plus-until-pipeline-cavalry-arrives?v=preview.

In North Dakota, the industry flared 526 million cubic feet a day in October 2018, the highest since the state began keeping records in 1990.[158] And while oil production from the Bakken Shale field hit a new record in June 2019 at 1.4 million barrels a day, the oil industry also wasted 24% of the natural gas it produced that month, burning 686 million cubic feet a day in flares rather than ship it to markets.[159] And oil production in Texas' Eagle Ford formation flares and vents nearly 100 million standard cubic feet per day.[160] This widespread flaring directly undercuts EPA's speculative claim that market incentives are sufficient to reduce emissions. Similarly, the low price of natural gas disincentivizes operators from finding and fixing methane leaks in order to bring additional product into the market.

- *EPA's claims regarding voluntary and state regulatory programs are arbitrary and capricious.*

EPA suggests with little to no analysis that voluntary and state regulatory programs will fill the regulatory vacuum.[161] These claims also run counter to the evidence before the agency. *State Farm*, 463 U.S. at 43. Of the thousands of oil and natural gas sources across the United States, only about 1% participate in voluntary programs to address methane emissions.[162] Further, even the participants in these voluntary programs, such as major oil companies like Exxon Mobil Corp., BP PLC, and Royal Dutch Shell PLC, recognize that voluntary efforts are not enough to address the problem and support EPA's direct regulation of methane from both new and existing sources.[163]

With respect to state regulations, EPA has failed to analyze whether the cited state rules are even applicable to existing sources.[164] To the contrary, state regulations only overlap with about 5% of the methane pollution that could be reduced by federal guidelines applied to existing sources.[165] In addition, many states do not directly regulate methane emissions. And, as demonstrated by the widespread flaring occurring in Texas and North Dakota cited above, state regulators continue to allow massive amounts of methane emissions from oil and natural gas operations notwithstanding state regulations. For instance, the Texas Railroad Commission has

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[158] Lee, *Gas glut spurs near-record flaring across shale states*, *supra* note 149.
[159] Lee, *Stopping gas flaring? N.D. governor looks to 'innovation'*, E & E News (Sept. 6, 2019), *available at* https://www.eenews.net/energywire/2019/09/06/stories/1061111287.
[160] Amer. Chem. Soc'y, *Reducing gas flares, pollution from oil production*, ScienceDaily (Aug. 17, 2016), *available at* https://www.sciencedaily.com/releases/2016/08/160817131702.htm.
[161] 84 Fed. Reg. at 50,276-77.
[162] See http://blogs.edf.org/energyexchange/2019/09/03/epas-proposal-to-rollback-methane-rules-ignores-scientific-evidence-will-lead-to-5-million-tons-of-methane-pollution/.
[163] *Supra* note 67.
[164] 84 Fed. Reg. at 50,277 n.102.
[165] *See* Attachment 11, McVay/Hull Decl. at ¶¶ 13-14.

granted hundreds of waivers to operators to allow flaring of natural gas, even when there are pipelines in place to transport the gas to market.[166]

EPA's suggestion that direct regulation of methane is not necessary because such emissions will be reduced and controlled through voluntary programs and state regulations also is directly contrary to the position the agency took in its 2016 Standard. In its responses to public comments, EPA explained why voluntary and state regulatory programs are not sufficient and thus it is necessary to directly reduce methane emissions from this source category through federal standards. Though agreeing that some emissions reductions have been achieved as a result of state requirements and voluntary programs, EPA explained that the NSPS is needed to counteract a general increasing trend in emissions:

> The EPA's GHG Inventory, which tracks total national emissions and includes data from 1990-2014, shows an increase in emissions from natural gas and petroleum production and natural gas processing, transmission and storage of 7 percent from 2011-2014, also with emissions from some sources declining and others increasing. Over the full GHG Inventory time series, these emissions increase 16 percent from 1990-2014, and have shown a general increasing trend in more recent years, for example, an increase of 10 percent from 2005-2014. The EPA disagrees with the commenter that the NSPS is unnecessary. The final NSPS is needed to reduce emissions from the oil and natural gas sector, and the health, welfare, and environmental benefits of this action once implemented will be significant.[167]

Contrary to the position EPA now takes, the agency in 2016 also recognized that: "While some states have made progress in establishing standards and reducing emissions, it is important to establish federal standards in order to yield a consistent and accountable national program. This will provide a clear path for states and other federal agencies to further align their

[166] Lee, *Flaring could threaten industry—Texas regulator*, E & E News (Oct. 23, 2019) *available at* https://www.eenews.net/energywire/stories/1061350989; *see also* Lee, *Texas vote triggers brawl over gas flaring*, E & E News (Aug. 7, 2019), *available at* https://www.eenews.net/energywire/2019/08/07/stories/1060869793; Lee, *Stopping gas flaring? N.D. governor looks to 'innovation'*, *supra* note 155.
[167] *See* Attachment 15, EPA Responses to Public Comment on 2016 Proposed Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, Chapter 12: Regulatory Impact Analysis, at 12-26.

programs."[168] Indeed, the 2016 Standard was "designed to complement current state and other federal regulations."[169]

The proposal represents a reversal of EPA's "former views as to the proper course." *See Public Citizen v. Steed*, 733 F.2d 93, 98 (D.C. Cir. 1984). EPA has failed to provide any explanation for its about-face change in policy position, let alone a reasoned justification, and has failed to provide a reasoned explanation for its rejection of its previous factual findings. *Fox Television Stations*, 556 U.S. at 515-16; *North Carolina v. EPA*, 531 F.3d 896, 906 (D.C. Cir. 2008) (quoting *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43)).

4. The Clean Air Act Section 108 Exclusion from Regulation for Criteria Pollutants Does Not Excuse EPA from Regulating Existing Sources of VOC Emissions from the Oil and Natural Gas Industry

In addition to its unlawful about-face on regulating methane emissions from existing sources, EPA also attempts to dodge its nondiscretionary duty to regulate VOC emissions from existing sources. EPA begins its discussion of existing source regulation by noting that Clean Air Act section 111(d) "authorizes" the regulation of existing sources for which a performance standard would apply if newly constructed.[170] But EPA is not just "authorized" to regulate existing sources, it has a nondiscretionary duty to do so—section 111(d) states that EPA "*shall* prescribe regulations" if the statutory test is met, as it is here.[171] EPA attempts to sidestep the very existence of a legal duty and then lays out a tortured interpretation of the Clean Air Act to explain why it should not have to regulate existing sources anyway. EPA errs on both counts.

[168] *See* Attachment 15, EPA Responses to Public Comment on 2016 Proposed Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, Chapter 13: Existing State, Local, and Federal Rules, at 13-11.

[169] 81 Fed. Reg. at 35,831 ("[T]hese rules are designed to complement current state and other federal regulations. We carefully evaluated existing state and local programs when developing these federal standards and attempted, where possible, to limit potential conflicts with existing state and local requirements. We recognize that, in some cases, these federal rules may be more stringent than existing programs and, in other cases, may be less stringent than existing programs. We received over 900,000 comments on the proposed rule. After careful consideration of the comments, we are finalizing the standards with revisions where appropriate to reduce emissions of harmful air pollutants, promote gas capture and beneficial use, and provide opportunity for flexibility and expanded transparency in order to yield a consistent and accountable national program that provides a clear path for states and other federal agencies to further align their programs.").

[170] 84 Fed. Reg. at 50,272.

[171] 42 U.S.C. § 7411(d)(1); *Shall*, BLACK'S LAW DICTIONARY (11th Ed. 2019) ("Has a duty to; more broadly, is required to . . . the mandatory sense that drafters typically intend and that courts should typically uphold[.]").

Clean Air Act section 111(d) provides that EPA "shall prescribe regulations" for states to develop plans with standards of performance "for any existing source for any air pollutant. . . to which a standard of performance under this section would apply if such existing source were a new source."[172] However, section 111(d) provides two carve-outs, only one of which is relevant here. The requirement to regulate existing sources does not apply if "air quality criteria have [] been issued" for the pollutant at issue or it is "included on a list published under section 7408(a) of this title."[173] This carve-out exclude from mandatory regulation under this section those pollutants that are already regulated as a criteria pollutant under Clean Air Act section 108 and well-controlled through the State Implementation Plan (SIP) process. As EPA noted in a proposed rulemaking in 1991, the goal of this provision is to regulate pollutants that "may cause or contribute to endangerment of public health or welfare but . . . [are] not controlled under sections 108 through 110 of the CAA."[174]

The oil and natural gas sources that are the subject of EPA's proposed rulemaking emit methane, HAP, and VOCs. By declining to regulate methane emissions from new sources, EPA removes methane from section 111(d)'s existing source requirement entirely, as methane emitted from the oil and gas sector will no longer be "an air pollutant" emitted from an existing source "to which a standard of performance . . . would apply if such existing source were a new source." As EPA acknowledges (though does not evaluate, as discussed *supra*), this decision to rescind the methane standard of performance for new sources has the "legal consequence" that existing sources in the source category "will not be subject to regulation under CAA section 111(d)."[175] However, even if EPA proceeds with its unlawful rescission of methane from regulation under 111(b), EPA still has a nondiscretionary duty to issue emission guidelines for VOC emissions from existing sources in the oil and gas source category.

EPA argues VOC emissions fall within the exclusion for pollutants already regulated under CAA section 108.[176] This theory is critically flawed: VOCs are not criteria pollutants, nor are they included on any list published under section 108(a). Instead, EPA argues that because VOCs are *precursors* to pollutants that *are* listed under section 108(a), VOC must also be excluded from regulation under section 111(d). But this is not what the statute says, and EPA's attempts to circumvent section 111(d)'s clear mandate are unavailing.[177]

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[172] 42 U.S.C. § 7411(d).
[173] *Id.* § 7411(d)(1).
[174] 56 Fed. Reg. at 24,469 (May 30, 1991).
[175] 84 Fed. Reg. at 50,272.
[176] 84 Fed. Reg. at 50,272.
[177] EPA also seeks comment on "the implications of the fact that methane in the atmosphere serves as a precursor to tropospheric ozone," implying that methane's status as an ozone precursor may fall within section 111(d)'s exclusion for criteria pollutants even if it were regulated under 111(b). 84 Fed. Reg. at 50,269. For the same reasons elaborated in this

(continued…)

If an air pollutant is emitted from an existing source that would be subject to an NSPS if it were a new source, EPA is required to regulate unless "air quality criteria have [] been issued" for the air pollutant at issue or if it is "included on a list published under section 7408(a) of this title." EPA bases its argument on the fact that precursors are included in the Clean Air Act's definition of "air pollutant." Specifically, the Clean Air Act provides that the term "air pollutant" includes "any precursors to the formation of any air pollutant, to the extent the Administrator has identified such precursor or precursors for the particular purpose for which the term 'air pollutant' is used."[178] But the fact that VOC, as a precursor to ozone and fine particulate matter (PM2.5), could be considered an "air pollutant" only satisfies the *initial* condition of section 111(d)'s carve out for criteria air pollutants ("any air pollutant"). It is not dispositive of the question whether the exclusion for air pollutants that are regulated as criteria pollutants apply here. Indeed, this exclusions cannot apply, since VOCs are not regulated as criteria pollutants.

EPA nonetheless argues that the definition of "air pollutant" is determinative because the term's statutory definition grants EPA discretion to decide what is included or excluded "for [the] particular purpose" the term is used. Thus, EPA concludes that it is appropriate to "classify VOC as a listed CAA section 108(a) pollutant for the particular purpose of applying the CAA section 108(a) exclusion in section 111(d)."[179] EPA makes four arguments supporting why the "particular purpose" of section 111(d) supports its interpretation, but each argument fails to grapple with the plain meaning of section 111(d), which creates a nondiscretionary duty for EPA to regulate VOC emissions from existing sources in the oil and gas industry.

EPA first argues that VOCs are "regulated under the CAA's NAAQS/SIP program" because they are precursors to listed pollutants ozone and PM, pointing to provisions of the Clean Air Act relating to requirements for ozone non-attainment areas that explicitly call for

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(...continued)
discussion with respect to VOCs, methane's status as an ozone precursor is irrelevant to whether EPA has a nondiscretionary duty to regulate methane emissions under section 111(d).

[178] In full, the Clean Air Act provides the following definition:

> The term "air pollutant" means any air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive (including source material, special nuclear material, and byproduct material) substance or matter which is emitted into or otherwise enters the ambient air. Such term includes any precursors to the formation of any air pollutant, to the extent the Administrator has identified such precursor or precursors for the particular purpose for which the term "air pollutant" is used.

§ 42 U.S.C. § 7602(g).

[179] 84 Fed. Reg. at 50,272.

reductions in VOC emissions.[180] However, the statutory test for whether a pollutant is excluded is not whether it is "regulated under" section 108 or section 110, the test is whether air quality criteria have been issued for the pollutant at issue, or the pollutant has been listed under section 108.[181] Neither is true here for VOC. The only pollutants for which air quality criteria have been issued or included on a list published under section 108(a) are sulfur dioxide, particulate matter smaller than 10 and 2.5 microns, carbon monoxide, ozone, oxides of nitrogen, and lead.[182]

Next, EPA makes a structural argument that excluding VOCs from regulation under 111(d) makes sense with respect to that section's "gap-filling" role, since VOCs are already "regulated as pre-cursors under CAA sections 108-110" and thus there is no gap to be filled.[183] However, this argument ignores the legislative history of section 111(d). Section 111(d) began as a Senate proposal with an explicit list of pollutants to be regulated.[184] Ultimately, this explicit list was replaced with gradually broader phrasing until the language we see today was included in the 1970 Clean Air Act Amendments. The legislative history reflects Congress' intent to give EPA the flexibility to regulate a broad range of pollutants, rather than to constrain EPA's discretion to a designated list of pollutants subject to regulation under section 111(d).[185] EPA's current interpretation would restrict the applicability of section 111(d) to a narrower set of pollutants than Congress intended, and indeed, to a narrower set of pollutants than the agency

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[180] 84 Fed. Reg. at 50,272 (citing Clean Air Act §§ 182(b)(1), (b)(2) & (c)(2)(B)).

[181] EPA's own section 111(d) implementing regulations reflect this distinction. 40 C.F.R. § 60.21a(a) (defining "designated pollutant" as "any air pollutant, the emissions of which are subject to a standard of performance for new stationary sources, but for which air quality criteria have not been issued and that is not included on a list published under section 108(a) or section 112(b)(1)(A) of the Act").

[182] *See* 40 C.F.R. Part 50 (National Primary and Secondary Ambient Air Quality Standards).

[183] 84 Fed. Reg. at 50,272.

[184] S. Rep. No. 91-1196 at 18 (Sept. 17, 1970).

[185] Early proposals in the Senate limited the existing source provisions to listed agents "[a]rsenic, chlorine gas, hydrogen chloride, copper, manganese, nickel, vanadium, zinc, barium, boron, chromium, selenium, pesticides, [and] radioactive substances." *Id.* But the last version printed in the Senate included broader applicability for "any air pollution agent or combination of such agents which is not subject to [section 108-110 or section 112] of this Act, and which has or may be expected to have an adverse effect on public health and the presence of which, in the ambient air, results from emissions from categories of stationary sources as defined pursuant to the provisions of [this section] of this Act." 91 H.R. 17255 (Sept. 22, 1970) (internal statutory references updated). And the final version of the Clean Air Act Amendments was enacted with language very similar to what we see in today's Clean Air Act, limiting applicability to "any existing source for any air pollutant (i) for which air quality criteria have not been issued or which is not included on a list published under section 108(a) or 112(b)(i)(A) but (ii) to which a standard of performance under subsection (b) would apply if such existing source were a new source[.]") Pub. L. No. 91-604, 84 Stat. 1676 (Dec. 31, 1970).

itself has regulated in the past.[186] Contrary to EPA's assertions in its Proposal, such a narrow interpretation upends the very idea of a "gap-filling" provision intended to give the agency the flexibility to regulate a broad range of pollutants where necessary to fill gaps left by the NAAQS and NESHAP programs.

Third, EPA analogizes to another provision in CAA section 112 to ostensibly demonstrate that Congress would have explicitly subjected precursors to regulation in section 111(d) if it wanted to, because it did so in section 112.[187] However, EPA's analogy is inapposite here. First, as EPA acknowledges, Congress provided a flexible definition of "air pollutant" depending on "the *particular purpose* for which the term 'air pollutant' is used."[188] And the particular purpose for which the term "air pollutant" is used in section 112 is quite different than in section 111(d). The relevant statutory provision in section 112 excludes from regulation as a HAP any "air pollutant[s] listed under section [108(a)]. . . except that. . . precursor[s] to a pollutant which [are] listed under section [108(a)]" can be regulated as a HAP.[189] EPA argues that to interpret the phrase "air pollutant[s] listed under section [108(a)]" as being exclusive of precursors would render meaningless the exception in 112(b)(2) for precursors. That may be true in the context of section 112, but it does not follow that the same interpretation applies in section 111, which lacks such an express statutory exception. Section 111(d) is a gap-filling provision—as described above, Congress intended the existing source provisions of section 111(d) to be a flexible route for EPA to fill gaps left by the NAAQS and NESHAPs. Section 112, on the other hand, was amended in 1990 with the specific Congressional intent to provide EPA with *less* discretion, rather than more. Congress was dissatisfied with EPA's slow pace identifying HAPs and regulating sources, and amended section 112 by removing the identification of HAPs from EPA's discretion and instead creating a list of almost 200 HAPs and a mandatory schedule for issuing emission standards.[190] That Congress expressly chose to subject criteria precursors to regulation in section 112 during amendments intended to cabin EPA's discretion and "force regulatory action"[191] does not support an interpretation that Congress intentionally chose to exclude criteria precursors from regulation under section 111(d), a gap-filling provision which Congress intended to provide flexibility. And given that the

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[186] *See* discussion of Municipal Solid Waste Landfills, *supra*.
[187] 84 Fed. Reg. at 50,272.
[188] CAA § 302 (emphasis added).
[189] CAA § 112(b)(2).
[190] S. Rep. 101-228 (Dec. 20, 1989) at 3 ("Very little has been done since the passage of the 1970 Act to identify and control hazardous air pollutants. In the nineteen year history of the Clean Air Act, just eight substances have been listed as hazardous air pollutants. . . NESHAPS have been promulgated for sources of only seven of these pollutants."); *id.* at 155-56 ("By establishing in the statute an initial list of chemicals to be regulated and requiring that the standards be based on maximum achievable control technology, the bill forces regulatory action to overcome the inertia that has plagued the health-based, standard-setting process authorized by current law. The reported bill creates a strong presumption to regulate a very large number of air pollutants. . .").
[191] *Id.* at 156.

definition of "air pollutant" explicitly demonstrates that its use may vary within the Clean Air Act depending on the particular purpose, EPA's analogy between different sections with different purposes does not withstand scrutiny.

In addition to the adequacy of its statutory arguments, EPA fails to acknowledge that its new interpretation contradicts the agency's own position in other regulations. In 1996, EPA finalized parallel rulemakings for new and existing municipal solid waste (MSW) landfills under Clean Air Act sections 111(b) and 111(d), respectively. Pollutants deemed harmful to human health emitted from MSW landfills included methane, VOCs, hazardous air pollutants, and odorous compounds, collectively termed "landfill gas."[192] EPA chose to use non-methane organic compounds (NMOC), which includes VOC, as a surrogate for landfill gas in it setting standards of performance and emissions guidelines for new and existing MSW landfills under CAA section 111(b) and 111(d). *Id.* EPA updated these regulations in 2016, with its new Emission Guidelines "expected to significantly reduce emissions of LFG [landfill gas] and its components, which include methane, *volatile organic compounds (VOC*), and hazardous air pollutants (HAP)."[193] EPA noted that reducing methane had become more important since the prior 1996 rulemaking, which had focused on NMOC (including VOCs) "because NMOC contain[ed] the air pollutants that at that time were of most concern due to their adverse effects on public health and welfare."[194] Thus, the 2016 Standard was focused on "reducing [both] the NMOC and methane components of LFG."[195] EPA acknowledged VOC was a precursor to criteria pollutants PM2.5 and ozone, but nowhere did EPA make the argument the agency now raises that VOCs' status as a precursor means that it is not subject to regulation under section 111(d).[196]

EPA's final argument, that it "has discretion to identify which pollutants should be classified as precursors for particular regulatory purposes," likewise falls short. First, it contradicts the agency's own argument in the preceding paragraphs that the definition of "air pollutant" in an unrelated provision should be considered analogous to the provision at issue here. Given that Congress provided flexibility in the definition of "air pollutant" depending on the particular regulatory purpose, the term's meaning in an unrelated provision does not have any bearing on its meaning here. Second, even if EPA does arguably have discretion in defining "air pollutant," it has failed to explain how its interpretation fits within the plain language of section 111(d). *See, e.g.*, *UARG v. EPA*, 573 U.S. 302, 321 (2014) ("Even under Chevron 's deferential framework, agencies must operate 'within the bounds of reasonable interpretation.' … And reasonable statutory interpretation must account for both 'the specific context in which ... language is used' and 'the broader context of the statute as a whole.'") And as demonstrated above, EPA's narrow interpretation also does not make sense within section 111(d)'s gap-filling

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[192] 61 Fed. Reg. at 9,905 (March 12, 1996).
[193] 81 Fed. Reg. at 59, 279 (Aug. 29, 2016) (emphasis added).
[194] *Id.* at 59, 281.
[195] *Id.*
[196] *See, e.g.*, *id.* at 59,281.

purpose. EPA has arbitrarily and capriciously interpreted section 111(d) in a manner contrary to its plain language, the structure of the Clean Air Act, and the agency's own prior practice.

D. EPA Fails to Consider Other Important Aspects of the Problem

1. The Proposed Rule Will Increase Interstate Transport of Ozone Affecting Downwind States

EPA does not dispute that the Proposed Rule will result in increased VOC emissions from the oil and natural gas sector. In fact, EPA acknowledges that the Proposed Rule will result in thousands of additional tons per year of VOCs from the transmission and storage segment.[197] VOC emissions are a precursor to ozone, but EPA has not addressed how its action will impact States' efforts to attain the ozone national ambient air quality standards (NAAQS), especially with respect to interstate transport issues, an area where courts have found EPA's efforts to be woefully inadequate. *See, e.g., New York v. EPA*, No. 19-1019 (D.C. Cir., Oct. 1, 2019) (vacating EPA's Determination Regarding Good Neighbor Obligations for the 2008 Ozone National Ambient Air Quality Standard, 83 Fed. 65,878 (Dec. 21, 2018) (Close-Out Rule)); *New York v. Wheeler*, No.19-CV-3287 (S.D.N.Y., July 25, 2019) (declaring EPA's failure to take action on New York's petition under section 126(b) of the Clean Air Act to be a violation of the statute and permanently enjoining EPA to take final action of such petition).

For example, Colorado is currently a Moderate nonattainment area for the 2008 ozone NAAQS, facing reclassification to Serious.[198] Colorado is also a Marginal nonattainment area for the 2015 ozone NAAQS.[199] Colorado has a regulatory program that includes stringent controls on the oil and gas industry, and Colorado's program largely applies to both new and existing sources.[200] However, several upwind states do not impose the level of controls found in Colorado's program and instead rely upon the 2012 Standard and the 2016 Standard to reduce emissions from this industry.

Colorado's monitors that typically register the most pollution (Chatfield, Rocky Flats North, and NREL) demonstrate the significant influence from upwind state emissions. EPA itself has estimated the impact to Colorado from upwind states, impact Colorado has evaluated as part of its "weight of evidence" analysis in its Moderate area ozone State Implementation Plan attainment demonstration, which was approved by EPA in 2018, as follows: [201]

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[197] *See* RIA at §1.4.
[198] 84 Fed. Reg. 41,674 (Aug. 15, 2019).
[199] 83 Fed. Reg. 25,776 (June 4, 2018).
[200] *See* 5 Colo. Code Reg. § 1001-9:XII and XVII.
[201] *See* 80 Fed. Reg. 46,271 (Aug. 4, 2015); Colorado's Moderate Area Ozone State Implementation Plan for the Denver Metro and North Front Range Nonattainment Area, approved by the EPA at 83 Fed. Reg. 31,068 (July 3, 2018).

	Chatfield	Rocky Flats North	NREL
Texas	0.35	1.58	1.15
New Mexico	0.13	1.05	0.54
Utah	1.59	0.87	1.34
Wyoming	1.22	0.67	0.73
California	1.23	1.75	1.93
5–State Total	4.52	5.92	5.69

Of these states, several are large oil and natural gas producing states, where emissions reductions from both new and existing sources may be foregone as a result of the Proposed Rule, threatening Colorado's ozone attainment efforts.

The Proposed Rule is deficient because EPA fails to address or justify how its action will impact Colorado and other downwind states negatively impacted by oil and natural gas emissions from upwind states.

2. EPA Has Not Addressed Whether, and to What Extent, the Proposed Rule Impacts Ozone Attainment Modeling

States that have areas currently designated as being in nonattainment of the ozone NAAQS with a classification of Moderate or higher have performed, and are likely still in the process of performing, ozone modeling to demonstrate attainment of the ozone NAAQS.[202] For example, Colorado submitted, and obtained approval of, its attainment demonstration as part of its Moderate area ozone State Implementation Plan, required by 42 U.S.C. §7511a(b)(1).[203] Further, as EPA has proposed to reclassify Colorado to Serious, Colorado is in the process of developing its attainment demonstration to submit with its Serious area ozone State Implementation Plan.[204] Colorado is not the only State engaged in this process.

States often rely upon EPA's oil and natural gas inventories in the development of their own inventories for oil and natural gas for purposes of ozone modeling. For example, Colorado is conducting continental scale photochemical grid modeling for ozone State Implementation Plan development work in the Denver Metro-North Front Range nonattainment area. Generally, Colorado develops the in-state emission inventory, except for some source sectors that rely on

[202] 42 U.S.C. §7511a(b)(1), (c)(1).
[203] 83 Fed. Reg. 31,068 (July 3, 2018).
[204] 84 Fed. Reg. 41,674 (Aug. 15, 2019).

EPA's National Emissions Inventories (NEI). For other areas in the model domain but outside of Colorado, the emission inventories rely on the EPA NEI and other emissions inventories developed jointly by EPA and Multi-Jurisdictional Organizations (MJO). The Proposed Rule does not address the extent to which EPA's oil and natural gas inventories rely on the 2016 Standard, nor does it address the impact to past and ongoing State attainment modeling that incorporates and relies upon EPA's inventories.

3. EPA's Regulatory Impact Analysis Is Arbitrary and Capricious in Relying on the "Interim" Social Cost of Methane

The Proposed Rule is also arbitrary and capricious because EPA improperly calculates its costs and benefits based on an inherently flawed Regulatory Impact Analysis. *See Center for Biological Diversity v. Bureau of Land Mgmt*., 422 F. Supp. 2d 1115, 1149 (N.D. Cal. 2006) (finding it arbitrary and capricious for agency's economic analysis "to rely on a critical assumption that lacks support in the record to justify" decision). EPA's new social cost of methane calculation not only departs from agency practice but also violates Executive Order 13,783 and the Office of Management and Budget's (OMB) Circular A-4—both of which, EPA concedes, guide EPA's analysis here—by failing to use the best available science and an appropriate discount rate.

In attempt to justify the Proposed Rule, EPA has calculated the costs and benefits using an "interim domestic Social Cost of Methane" metric that greatly undervalues the impacts of increased methane emissions by failing to consider the full, global impacts of these emissions.[205] This new interim measure instead considers only "domestic" impacts. The effect of this swap is to significantly reduce the estimated benefits of the 2016 Standard, rendering them lower than largely unchanged compliance costs, without reasoned justification or basis in the record. EPA claims that Executive Order 13,783 directed EPA to rely on this "interim" measure.[206] However, Executive Order 13,783 still requires agencies to "monetiz[e] the value of changes in greenhouse gas emissions" and ensure that such estimates are "consistent with the guidance contained in OMB Circular A-4."[207] OMB Circular A-4, in turn, requires that agencies use "the best reasonably obtainable scientific, technical, and economic information available. To achieve this, [agencies] should rely on peer-reviewed literature, where available."[208]

The Interagency Working Group ("IWG")'s approach continues to represent the best available science in monetizing the impacts of changes in GHG emissions, despite that Executive Order 13,783 disbanded the IWG and withdrew the technical support documents upon which the prior social cost of methane calculation was based. Federal agencies first developed the social

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[205] RIA at 3-7.
[206] *Id.,* at 3-8.
[207] 82 Fed. Reg. at 16,096.
[208] Office of Management and Budget, Circular A-4, at 17 (Sept. 17, 2003), *available at* https://www.whitehouse.gov/omb/circulars_a004_a-4 ("OMB Circular A-4").

cost of GHGs under President George W. Bush. The IWG was specifically organized to develop a single, harmonized value for federal agencies to use in their regulatory impact analyses under Executive Order 12,866. The IWG developed its approach over several years, through robust scientific and peer-reviewed analyses and public processes.

By contrast, EPA's "interim" measure lacks substantial analysis, much less peer review, and arbitrarily ignores most of the costs imposed by methane emissions. As EPA itself admits, the metric "will be used in regulatory analysis until improved domestic estimates can be developed …."[209] EPA's substitution of the IWG's social cost of methane with an unvetted and outcome-driven "interim" measure is arbitrary and capricious. Moreover, even EPA's underlying estimate of domestic damages is flawed. The 2017 paper by William D. Nordhaus on which EPA relies for that estimate demonstrates that such estimates vary based on the model used, and the author himself states that "regional damage estimates are both incomplete and poorly understood," and "[a] key message here is that there is little agreement on the distribution of the [social cost of carbon] by region."[210] Furthermore, neither Executive Order 13,783, OMB Circular A-4, nor Executive Order 12,866 allows EPA to completely ignore international impacts in its Regulatory Impact Analysis. To the contrary, OMB Circular A-4 specifically recognizes that a regulation may "have effects beyond the borders of the United States," and states that an agency's economic analysis should encompass "all the important benefits and costs likely to result from the rule," including "any important ancillary benefits."[211] Further, OMB Circular A-4 provides guidance for the implementation of Executive Order 12866, which directs agencies to assess "all costs and benefits" of regulatory actions.[212]

Nor does the best available science support the use of a "domestic-only" value of the social cost of GHG emissions.[213] The effects of GHGs do not stop at the U.S. border; emissions in India and China, for example, can cause damage to U.S. companies and citizens (and vice versa). EPA's use of a domestic number to justify greater U.S. emissions creates a dangerous precedent that other countries may also follow to relax their own emissions. Such increased global emissions will, in turn, harm the U.S. and its citizens.[214] EPA's domestic social cost of methane also omits important spillover effects on U.S. corporations. The negative effects of global climate change—such as increased armed conflicts and extreme weather events—impact

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[209] RIA at 3-9.
[210] Nordhaus, William D., *Revisiting the social cost of carbon*, 114(7) Proceedings of the Nat'l Acad. of Sciences of the United States, 1518-23 (2017), *available at* http://www.pnas.org/content/114/7/1518.full.pdf.
[211] OMB Circular A-4.
[212] Executive Order 12866, 58 Fed. Reg. 51,735 (Oct. 4, 1993).
[213] *See* Attachment 13, Expert Report by Maximilian Auffhammer et al., The Use of the Social Cost of Carbon in the Federal Proposal "Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks," (Oct. 19, 2018) (EPA-HQ-OAR-2018-0283-5842).
[214] *Id.,* at 7-8.

U.S. corporations both directly (through assets they own) and indirectly (through disruptions of supply chains).[215] Using a domestic social cost of methane also fails to consider the welfare of nine million U.S. citizens living abroad and 450,000 men and women serving in the U.S. armed forces abroad who are affected by extreme weather events outside U.S. borders. Moreover, despite sound science demonstrating that climate change will lead to an increase in the frequency of conflict domestically and globally, EPA fails to account for the likelihood that the number of American troops who will be deployed abroad will increase.[216] The "domestic only" approach is further belied by the Assessment, which contains an entire chapter on "Climate Effects on U.S. International Interests."[217] Consequently, EPA cannot ignore the global costs of increased methane emissions that will result from the Proposed Rule.

Furthermore, the use of a seven percent discount rate is contrary to the best available science and thus arbitrary and capricious.[218] In a 2015 survey of experts in the economics of climate change, the median discount rate chosen was 2% (when they were asked to choose a fixed discount rate; in fact, half the experts supported the concept of a discount rate that declines over time).[219] EPA itself, over a decade ago, made the case for considering even lower discount rates:

> There are reasons to consider even lower discount rates in discounting the costs of benefits of policy that affect climate change. First, changes in GHG emissions—both increases and reductions—are essentially long-run investments in changes in climate and the potential impacts from climate change. When considering climate change investments, they should be compared to similar alternative investments (via the discount rate). Investments in climate change are investments in infrastructure and technologies associated with mitigation; however, they yield returns in terms of avoided impacts over a period of one hundred years and longer. Furthermore, there is a potential for significant impacts from climate change, where the exact timing and magnitude of these impacts are unknown. These factors imply a highly uncertain investment environment that spans multiple generations. When there are important benefits or costs that affect multiple generations of the population, EPA and OMB allow for low but positive discount rates (e.g., 0.5–3% noted by U.S. EPA, 1–3% by OMB).[220]

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[215] *Id.,* at 9-10.
[216] *Id.*, at 10-11.
[217] Assessment at ch. 16.
[218] Drupp, M.A., Freeman, M., Groom, B. and Nesje, F., *Discounting disentangled*, 10(4) American Economic Journal: Economic Policy, American Economic Association 109-34 (Nov. 2018).
[219] Expert Consensus on the Economics of Climate Change, Institute for Policy Integrity, 2015, at 20. https://policyintegrity.org/files/publications/ExpertConsensusReport.pdf
[220] Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. 44353, 73414 (2008).

Because of the long-term, irreversible consequences of climate change, the effects of emissions today will be felt for many years into the future. Thus, as OMB explained in 2015, "the use of 7 percent is not considered appropriate for intergenerational discounting. There is wide support for this view in the academic literature, and it is recognized in Circular A-4 itself."[221] The Proposed Rule fails to provide a reasonable justification for adding consideration of a seven percent discount rate.

Finally, the Regulatory Impact Analysis fails to consider adequately the unquantified, foregone benefits of the 2016 Standards, such as the public health benefits of reducing many additional tons of VOC emissions, or the numerous health and welfare consequences of climate change – such as health effects of forest fires, or the decline of the shellfish industry due to ocean acidification - that are not accounted for in the Social Cost of Carbon models.[222] As OMB Circuit A-4 provides, "when there are important non-monetary values at stake, you should also identify them in your analysis so policymakers can compare them with the monetary benefits and costs. When your analysis is complete, you should present a summary of the benefit and cost estimates for each alternative, including the qualitative and non-monetized factors affected by the rule, so that readers can evaluate them."[223] EPA has failed to consider such impacts in its Proposed Rule.

III. SECTION 111(B) DOES NOT REQUIRE EPA TO MAKE A POLLUTANT-SPECIFIC SIGNIFICANT CONTRIBUTION FINDING FOR GHG EMISSIONS (OR FOR METHANE SPECIFICALLY) FROM THE SOURCE CATEGORY AS A PREREQUISITE TO REGULATING THOSE EMISSIONS

The interpretation of section 111(b) that EPA set forth in the 2016 Standard is correct. EPA should not now reverse its interpretation and adopt the position that it must determine that each individual pollutant from an already-listed source category be evaluated to determine whether it "causes, or significantly contributes to" dangerous air pollution before EPA can issue

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[221] Interagency Working Group on the Social Cost of Carbon, Response to Comments: Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12,866 at 36 (July 2015).
[222] The paper *Omitted Damages: What's Missing From the Social Cost of Carbon* (Peter Howard, for EDF, NRDC and the Institute for Policy Integrity, 2014) details some of the numerous costs of climate change that are not included in the social cost of carbon models:

> These omissions include climate impacts on the following market sectors: agriculture, forestry and fisheries (including pests, pathogens and weeds, erosion, fires, and ocean acidification); ecosystem services (including biodiversity and habitat loss)); health impacts (including Lyme disease and respiratory illness from increased ozone pollution, pollen, and wildfire smoke).

Omitted Damages at 5.
[223] OMB Circular A-4 at 3.

standards of performance for that source category. As explained below, EPA has no valid justification for changing its existing interpretations in response to comments it solicits in Section IV of the Proposed Rule.

A. EPA Cannot Reverse its Position Merely by Asking for Comments on Whether it Should Adopt a New Position Diametrically Opposed to Both Current Law and the Position it Maintains in the Proposed Rule

EPA states in the Proposed Rule that it is not proposing to change its legal interpretation of its authority to regulate GHG emissions from the oil and natural gas source category under section 111. After summarizing the legal justifications it relied on in the 2016 Standard to regulate GHG emissions from these sources, EPA reaffirms that "EPA proposes to retain its current interpretation that it is not required to make a pollutant-specific [significant contribution finding], for the same reasons that it noted in the [2016 Standard]."[224] But EPA also oddly requests comments on legal interpretations it is explicitly rejecting and not proposing. Yet throughout Section VI of the Proposed Rule,[225] EPA invites comment on whether, in fact, it lacks the authority to regulate GHG from these sources on the current record and how it could go about regulating them in some other manner.

Section 307(d)(3) of the Clean Air Act, 42 U.S.C. § 7607(d)(3), requires EPA to issue a specific notice of a "proposed rule" as a focal point for public comments, which "shall be accompanied by a statement of its basis and purpose." To satisfy that requirement, a final rule need not be identical to a proposed rule, but it must be a "logical outgrowth." *See Portland Cement Ass'n v. EPA*, 665 F.3d 177, 189 (D.C. Cir. 2011). EPA's use of Section VI to solicit comments supporting legal interpretations it says it is not proposing raises the suspicion that the agency is simply fishing for grounds on which it can reverse these legal positions in the final agency action (or in some later rulemaking), and thereafter claim that the public had sufficient notice of that outcome in this Proposed Rule. This would violate bedrock principles of administrative rulemaking and the Clean Air Act.

In *Environmental Integrity Project v. EPA*, 425 F.3d 992 (D.C. Cir. 2005), the D.C. Circuit Court rejected a similar attempt by EPA. There, EPA proposed to codify its interpretation of the rules through an amendment of regulatory text, but wound up adopting a conflicting interpretation in the final action. In finding that EPA violated the Administrative Procedure Act, the court observed that "[w]hatever a 'logical outgrowth' of this proposal may include, it certainly does not include the Agency's decision to repudiate its proposed interpretation and adopt its inverse." *Id.* at 998. The court explained that mentioning in the proposal the converse of the Agency's proposed position—as EPA does here in Section VI—does not satisfy basic administrative rulemaking requirements:

[224] 84 Fed. Reg. at 50,246; *see also id.* at 50,261.
[225] *Id.* at 50,261-71

> EPA argues that it met its notice-and-comment obligations because its final interpretation was also mentioned (albeit negatively) in the Agency's proposal. However, this argument proves too much. If the APA's notice requirements mean anything, they require that a reasonable commenter must be able to trust an agency's representations about *which particular* aspects of its proposal are open for consideration. A contrary rule would allow an agency to reject innumerable alternatives in its Notice of Proposed Rulemaking only to justify any final rule it might be able to devise by whimsically picking and choosing within the four corners of a lengthy "notice." Such an exercise in "looking over a crowd and picking out your friends," does not advise interested parties how to direct their comments and does not comprise adequate notice . . . .

Id. at 998 (citations omitted); see also Small Refiner Lead Phase-Down Task Force v. EPA, 705 F.2d 506, 549 (D.C. Cir. 1983) ("EPA must itself provide notice of a regulatory proposal. Having failed to do so, it cannot bootstrap notice from a comment."); *Shell Oil Co. v. EPA*, 950 F.2d 741, 760 (D.C. Cir. 1991) ("[W]hen a final rule bears little resemblance to the one proposed, the parties are deprived of their [Administrative Procedure Act] rights to notice and comment.").

EPA cannot revoke the legal justifications for the 2016 Standard based on comments it receives in response to its Proposal *not* to change those justifications, as doing so would serve as a boundless exception to Clean Air Act rulemaking requirements. In addition, for the reasons explained above, EPA also may not use comments submitted in response to this Proposed Rule as a basis taking final action on other standards of performance applicable to sources outside the oil and natural gas source category.

B. There is No Justification for EPA to Reverse its Interpretation of Section 111(b)

EPA is correct that it need not make a new endangerment and significant contribution finding each time it regulates an additional pollutant from a source category that is already listed under section 111(b)(1)(A), and it should not reverse its position. Forty years ago, EPA found the oil and natural gas source category to be a significant contributor to air pollution that endangers public health and welfare, and it listed it pursuant to section 111(b)(1)(A). Based on the fact that these sources were already listed, EPA's legal position has been that it may establish additional standards of performance for the source category—such as the GHG standards it issued in 2016—so long as it demonstrates that it has acted reasonably (i.e., with a "rational basis") in setting the additional standards of performance under section 111(b)(1)(B).

> [B]ecause the EPA is not listing a new source category in this rule, the EPA is not required to make a new endangerment finding[226] with regard to the oil and natural gas source category in order to establish standards of performance for an additional pollutant from those sources. Under the plain language of CAA section 111(b)(1)(A), an endangerment finding is required only to list a source category. Though the endangerment finding is based on determinations as to the health or welfare impacts of the pollution to which the source category's pollutants contribute, and as to the significance of the amount of such contribution, the statute is clear that the endangerment finding is made with respect to the source category; CAA section 111(b)(1)(A) does not provide that an endangerment finding is made as to specific pollutants.[227]

In addition, there are no differences between GHG (such as methane) and other pollutants that would support EPA creating an exception to its current position that additional, separate endangerment and significant contribution findings are not required each time it regulates an additional pollutant by an already-listed source category. Such a change in position would be especially unwarranted where EPA already found the pollutant to endanger public health and welfare.[228] Furthermore, the U.S. Supreme Court ruled in *Massachusetts v. EPA*, 549 U.S. 497, 520 (2007), that GHG meet the definition of "air pollutant" under the Clean Air Act and premised its decision in *AEP v. Connecticut*, 564 U.S. 410, 424 (2011), on its view that section 111 applies to GHG emissions.

C. EPA Has Not Historically Interpreted Section 111(b) to Mandate an Additional "Significantly Contributes" Finding Before It Can Regulate a New Pollutant From a Previously Listed Source

EPA now—by parsing tangential language from a 1977 guideline document for phosphate fertilizer plant emissions—for the first time purports to discover that "it appears to be the case that the EPA in the past did so interpret CAA section 111(b)(1)(A) to require a pollutant-specific SCF as a prerequisite for regulating that pollutant."[229] The quoted language does not establish

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[226] EPA explained in the 2016 Standard that throughout that document, it used the phrase "endangerment finding" to "encompass[] both of the 'causes or contributes significantly to' component and the 'endanger public health or welfare' component of the determination" required under section 111(b)(1)(A). 81 Fed. Reg. at 35,828.
[227] 81 Fed. Reg. at 35,841-42.
[228] *See id.,* at 35,833-40; Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,510, 64,530-31 (Oct. 23, 2015) (making endangerment and contribution findings for GHG from fossil fuel-fired power plants under section 111(b)(1)(A)); Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009).
[229] 84 Fed. Reg. at 50,266.

that this was EPA's previous interpretation. In that document, EPA was not discussing subsequent listings of pollutants from previously listed sources—which is what EPA has put at issue in this request for comment—and, of course, it would have had no occasion to do so in such a guideline document. The quoted language is better read to simply explain the general relationship between section 111(b) regulation of new sources and section 111(d) regulation of existing sources: the only pollutants from existing sources subject to 111(d) are those that are already regulated for that source category under section 111(b). Thus, the excerpt from the 1977 phosphate fertilizer document simply does not show that EPA had earlier taken the position it now suggests. Instead, EPA's practice has often been to list source categories under section 111(b)(1)(A) without first making specific "contribute significantly" findings for any specific pollutants at all.[230] EPA's citation to this isolated 1977 language does not provide a "reasoned basis" for EPA to change its position. *See Fox Television*, 556 U.S. at 516.

D. Neither GHG Emissions (In General) Nor Methane Emissions From the Oil and Natural Gas Sector (In Particular) Give EPA a Basis to Reverse Course and Evaluate a New Pollutant-Specific Significant Contribution Finding

Even if EPA determines that section 111(b)(1)(A) is "ambiguous" with respect to whether it must make a pollutant-specific significant contribution finding for an already-listed 111(b) source category before regulating emissions of that pollutant,[231] there is no reason for it to reexamine its authority to regulate GHG emissions from this source category. The oil and natural gas source category continues to emit a large amount of GHG to the atmosphere, in both absolute and relative terms. Given the harms produced by increasing atmospheric concentrations of GHG, it would be irrational for EPA to decide to remove existing emissions controls by creating new legal interpretations to constrain its authority to implement section 111. EPA would not have a reasoned basis for reversing its current position that GHG emissions from the oil and natural gas source category are significant under section 111(b)(1)(A).

In making its 2016 finding that GHG emissions from the oil and natural gas source category contribute significantly to air pollution that endangers health and welfare, EPA noted the relative size of those emissions.[232] Further, EPA properly concluded in 2016 that whether the

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[230] *See* List of Categories of Stationary Sources, 36 Fed. Reg. 5,931 (Mar. 31, 1971); Priority List and Additions to the List of Categories of Stationary Sources, 44 Fed. Reg. 49,222 (Aug. 21, 1979).
[231] 84 Fed. Reg. at 50,266-67
[232] *See* 81 Fed. Reg. at 35,838 & tbl.3 ("Natural gas and petroleum systems are the largest emitters of methane in the United States. These systems emit 32 percent of United States anthropogenic methane."); *id.* at 35,830 ("According to data from the Greenhouse Gas Reporting Program (GHGRP), oil and natural gas operations are the second largest stationary source of GHG emissions in the United States . . . , second only to fossil fuel electricity generation."); *id.*
(continued…)

GHG emissions from the oil and natural gas source category are considered on a domestic or global scale, they are significant:

> [T]he collective GHG emissions from the oil and natural gas source category are significant, whether the comparison is domestic (where this sector is the largest source of methane emissions, accounting for 32 percent of United States methane and 3.4 percent of total United States emissions of all GHG), global (where this sector, while accounting for 0.5 percent of all global GHG emissions, emits more than the total national emissions of over 150 countries, and combined emissions of over 50 countries), or when both the domestic and global GHG emissions comparisons are viewed in combination.[233]

EPA further took the position in its response to public comments on the proposal that became the 2016 Standard that the rule would be significant even though climate change is a global phenomenon. EPA correctly explained that:

> [I]t is precisely because climate change is a global phenomenon that small percentage changes are so relevant. There are hundreds of countries, and thousands of sources, so no individual country of source will be a substantial fraction of the whole. Therefore, reducing the rate of climate change is not a matter of reducing a few large sources, but rather of addressing a large number of smaller sources. Therefore, reductions of a fraction of a percent can be substantial and important when solving a global problem.[234]

Data EPA cites in the Proposed Rule show that nothing about the source category has changed that would justify EPA reversing its position that GHG emissions from those sources contribute significantly to dangerous air pollution. EPA now calculates that the source category emits 29 percent of U.S. anthropogenic methane, 3 percent of total U.S. GHG emissions, and 0.4 percent of global GHG emissions.[235] The difference between EPA's new figures and the ones it determined in 2016 met the criteria for a significant contribution finding are negligible and do not support EPA reversing its previous finding. *See Fox Television*, 556 U.S. at 516 ("a reasoned explanation is needed for disregarding facts and circumstances that underlay or were engendered by the prior policy"); *National Cable & Telecommunications Ass'n v. Brand X Internet Servs.*, 545 U.S. 967, 981 (2005)

(...continued)
at 35839 ("[T]hese emissions (CH_4 and CO_2) account for 4.0 percent of total United States domestic GHG emissions.").

[233] 81 Fed. Reg. at 35,840.

[234] *See* Attachment 15, EPA Response to Comments on the EPA's Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, at 2-37 (May 2016), Docket ID EPA-HQ-OAR-2010-0505-7632.

[235] 84 Fed. Reg. at 50,249, 50,271 tbl.7 & tbl.8.

("Unexplained inconsistency" in agency policy is "a reason for holding an interpretation to be an arbitrary and capricious change from agency practice.")

E. EPA Has Not Presented a Credible Argument That Congress Did Not Mean What It Said In Section 111(b)(1)(A)

Citing to *Engine Manufacturers Association v. EPA*, 88 F.3d 1075, 1089 (D.C. Cir. 1996), EPA suggests that maybe it does not need to follow the directions Congress gave to it in section 111(b)(1)(A) if, "as a matter of historical fact, Congress did not mean what it appears to have said, or that, as a matter of logic and statutory structure, it almost surely could not have meant it."[236] There is no reason for EPA to conclude, however, that Congress could not have meant that a significance finding only needs to be made at the time the source category is initially listed under section 111(b)(1)(A).

Retaining EPA's current interpretation (as articulated in the 2016 Standard) does not produce an anomalous result. EPA raises the possibility that unless it conducts a separate significant contribution analysis for each pollutant emitted by the source, EPA could list the source category on the ground that a combination of pollutants significantly contributed, and then have to regulate each pollutant on an individual basis.[237] EPA has not historically considered this to be a problem. Indeed, in the 1978 document EPA now cites to for the history of the oil and natural gas source category, EPA was well aware that in prioritizing source categories for section 111(b) listing and development of performance standards, some sources would have more than one pollutant of concern regulated under that section.[238]

Moreover, in 1979 when EPA made a general finding that this source category itself (and 58 others) were significant sources and therefore listed under section 111(b)(1)(A), it did not identify the pollutants causing the significant contribution for each source category.[239] Five years later, EPA issued section 111(b) performance standards for the oil and natural gas source category in two separate rulemakings, three months apart—one for VOCs and one for sulfur dioxide—neither of which analyzed or even mentioned whether one, both, or a combination of

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[236] 84 Fed. Reg. at 50,263.
[237] 84 Fed. Reg. at 50,263.
[238] Priorities for New Source Performance Standards Under the Clean Air Act Amendments of 1977, at 111, Apr. 1978, EPA–450/3–78–019 ("It was assumed that whenever a standard was set for a pollutant from a source category, the standards for all other pollutants from that source were also set. To account for the additional work required to develop standards for other pollutants, it was assumed that a 25% increase in effort would be required for each additional pollutant. Thus, a source emitting 5 pollutants would require as much effort as 2 sources emitting only one pollutant each.") (Docket ID EPA-HQ-OAR-2017-0757-0009, att. 1).
[239] Priority List and Additions to the List of Categories of Stationary Sources, 44 Fed. Reg. 49,222, 49,225 (Aug. 21, 1979); *see also* 84 Fed. Reg. at 50,262 (acknowledging that "the SCFs for the source categories did not identify the air pollutants").

those two pollutants significantly contributes to harmful emissions.[240] Contrary to what EPA suggests in the Proposed Rule, the "anomalous result" would be if EPA were now to adopt a new interpretation of section 111(b)(1)(A) that would call into question the validity of the listing process EPA has been using for decades for dozens of source categories, including for oil and natural gas sources.

EPA also suggests that its current rational basis interpretation could be irrational because it is not explicitly defined in the Clean Air Act.[241] Given that many decisions delegated to EPA (and other federal agencies) are governed by a default rational basis standard, also found in section 706(2)(A) of the Administrative Procedure Act, it is more reasonable to conclude that Congress could have intended that standard to govern the regulation of subsequent pollutants from previously-listed sources in the absence of any other prescription for how EPA is to make the decision. Certainly, the independent existence of the rational basis standard apart from the Clean Air Act does not show that Congress "could not have meant" what it said in section 111(b)(1)(A). The Proposed Rule points out that "in instances before [2016] in which the EPA has relied on the 'rational basis' approach, the EPA has done so to justify not setting standards for a given pollutant, rather than to justify setting a standard for a pollutant."[242] There is no reason to believe that Congress originally in 1970—or in 1977 when it amended the relevant language in section 111(b)(1)(A) and demanded that EPA *accelerate* the issuance of section 111(b) standards—intended to make it *harder* for EPA to regulate an additional pollutant than not to regulate an additional pollutant.

That Congress may have required pollutant-specific findings for other regulatory schemes under other sections of the Clean Air Act does not demonstrate that Congress could not have intended EPA to be able to regulate subsequent pollutants from a listed source so long as EPA has a rational basis to do so. EPA now suggests that Congress's use of different terms in different sections "might reasonably be viewed as heightening the anomaly of interpreting CAA 111(b)(1)(A) not to impose the same requirement."[243] But instead of being an anomaly, Congress's choice to use different phrasing in different sections, especially because it amended them all at the same time in the same section of the 1977 Amendments,[244] shows that Congress knew how to require pollutant-specific findings when it wanted to do so.

EPA's suggestion that Congress possibly did not say what it meant when it drafted section 111(b) in 1970 because it "conflated" pollutant-specific significant contribution findings with source-category significant contribution findings is not supported. EPA's claim that Congress

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[240] Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants, 50 Fed. Reg. 26,124 (June 23, 1985); Standards of Performance for SO_2 Emissions from Onshore Natural Gas Processing, 50 Fed. Reg. 40,160 (Oct. 1, 1985).
[241] 84 Fed. Reg. at 50,263.
[242] *Id.* at 50,263.
[243] 84 Fed. Reg. at 50,263.
[244] Clean Air Act Amendments of 1977, Pub. L. No. 95-95, § 401, 91 Stat. 685, 790-91.

redrafted section 111 and other provisions in 1977 with "cause and contribute" style finding requirements with an aim to "create a uniform standard of proof," actually supports the inference that Congress intended the words of section 111(b) to mean what they say. If Congress had originally "conflated" the two concepts in 1970, as EPA suggests, it had ample opportunity to disentangle them and say what it really meant when it redrafted some of the language in that provision in 1977. But instead Congress retained the same structure in 111(b).

EPA now also speculates that the 1977 amendments to section 111(f) directing EPA to add new source categories by considering the quantity of emissions that each category will emit and "the extent to which each such pollutant may reasonably be anticipated to endanger public health or welfare" could mean that "Congress recognized the EPA's ability to consider, under CAA section 111, the impacts of specific pollutants," and that EPA would only be considering pollutants it had determined "may reasonably be anticipated to endanger."[245] EPA's actions in response to this direction from Congress do not show that EPA ever had that understanding. Instead, EPA did not proceed to make specific "contribute significantly" or endangerment findings for each source or each pollutant, but instead prioritized the timing of setting performance standards for source categories it had already listed under section 111(b).[246]

F. If EPA Reverses its Current Legal Interpretation and Determines That Section 111(b) Requires a Pollutant-Specific Significant Contribution Finding, It Should Not Take Any Action to Call Into Question the Validity of Previously Issued NSPS and Section 111(d) Guidelines and State Plans

As EPA concedes, it "has proceeded under the implicit assumption that [111] does not require a pollutant-specific SCF through many NSPS rulemakings over a lengthy period."[247] In promulgating the dozens of NSPS over the past four decades, EPA typically has made broad findings that the source category emitted pollutants that significantly contributed to pollution that endangered health and welfare, without basing that determination on a source-specific analysis of the quantity, relative contribution, or harm from each and every pollutant to be regulated. EPA has provided no evidence to the contrary. Reversing course now and calling into question, or worse, repealing, its dozens of NSPS would be arbitrary and capricious and would harm the reliance interests of states, regulated sources, and citizens who relied on the continuation of EPA's regulatory interpretations.

An example of EPA's typical approach for regulating multiple pollutants from a source under section 111(b) is its NSPS for stationary compression internal combustion engines,

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[245] 84 Fed. Reg. at 50,265.
[246] *See* Priorities for New Source Performance Standards Under the Clean Air Act Amendments of 1977, Apr. 1978, EPA–450/3–78–019.
[247] 84 Fed. Reg. at 50,266.

finalized in 2006.[248] The NSPS set standards limiting emissions of five different pollutants—nitrogen oxides (NO_X), particulate matter (PM), sulfur dioxide (SO_2), non-methane hydrocarbons (NMHC), and carbon monoxide (CO)—with varying performance standards for each pollutant depending on the engine's power and type.[249] The proposed rule for those engines described harms from each of the pollutants and stated in general that reducing each will provide health and welfare benefits. But EPA did not propose that each individual pollutant on its own "contributes significantly to" air pollution endangering health and welfare. Instead, it simply proposed that emissions from the source category collectively "contribute significantly to air pollution and cause adverse health and welfare effects associated with ozone, PM, NO_X, SO_X, CO, and NMHC."[250] The final rule said even less, not formally making a "contribute significantly" finding as to the pollutants either collectively or individually, and simply stating that "[t]he standards will implement section 111(b) of the Clean Air Act (CAA) and are based on the Administrator's determination that stationary [engines in the category] cause, or contribute significantly to, air pollution that may reasonably be anticipated to endanger public health or welfare."[251]

If EPA now contradicts decades of practice and interpretation and undermines or repeals the dozens of NSPS it has issued during that time, health and welfare will suffer. After all, preventing harm to health and welfare from their pollutants is why section 111(b) required EPA to regulate those sources in the first place. EPA's reversal of precedent would also call into question the validity of state implementation plans that were based in part on the continued existence of regulation under section 111(b), as well as the validity of state and federal plans based on section 111(d) guidelines. This result would be arbitrary and capricious for failure to take into account the reliance interests and significant harms that would result from EPA's new interpretation. *See Encino Motorcars, LLC v. Navarro*, 136 S. Ct. 2117, 2126 (2016) ("In explaining its changed position, an agency must also be cognizant that longstanding policies may have 'engendered serious reliance interests that must be taken into account.'"); *Mingo Logan Coal Co. v. EPA*, 829 F.3d 710, 723-24 (D.C. Cir. 2016) (explaining that the "more detailed justification" requirement in *Fox Television* can be independently triggered by either reliance interests or agency reversal of a previous position); *id.* at 218-19 (Kavanaugh, J., dissenting) (arguing that EPA failed to provide the "more detailed justification" required when it revoked a coal mine's permit; "When a permit induces reliance, it has long been recognized that those settled expectations should not be lightly disturbed by intervening government action.").

[248] Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, Final Rule, 71 Fed. Reg. 39,154 (July 11, 2006).
[249] *Id.* at 39,156 tbl.1.
[250] Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, Proposed Rule, 70 Fed. Reg. 39,870, 39,881-82 (July 11, 2005).
[251] 71 Fed. Reg. at 39,154.

G. It Would be Arbitrary and Capricious to Create a Separate Process and Standard for GHG Emissions That are Different From Those Applied to other Air Pollutants

In yet another attempt to undermine regulation of GHG emissions under section 111, EPA suggests that its new mandatory significant contribution finding (and endangerment finding) requirement may apply only to GHG because that pollutant was not regulated at the time the oil and natural gas source category was first listed under section 111(b).[252] Even if the new interpretation were lawful, nothing in the Clean Air Act suggests that EPA can apply its new interpretation only to a particular pollutant or set of pollutants, such as GHG, and doing so would be arbitrary and capricious and contrary to the text, structure, and purpose of the Act. Similarly, EPA's suggestion that there could be some exception to its new interpretation for those pollutants regulated "shortly []after" the initial listing of a source category has no basis in the statute or rational rulemaking. It appears aimed at making regulation of GHG emissions more difficult based on a principle that EPA would be unwilling to apply to any previous listings that followed the same allegedly flawed process. In other words, EPA's suggestion of a new, higher burden before regulating GHG seems designed only to undermine its rules for fossil fuel fired power plants and oil and natural gas facilities.[253] This rationale is plainly arbitrary and unlawful and fails to satisfy EPA's burden to justify its changed interpretation. *See Fox Television*, 556 U.S. at 516.

IV. EVEN IF EPA WERE REQUIRED TO MAKE A POLLUTANT-SPECIFIC SIGNIFICANT CONTRIBUTION FINDING FOR GHG, THE ENDANGERMENT AND SIGNIFICANT CONTRIBUTION FINDINGS EPA MADE FOR THE 2016 STANDARD AMPLY SATISFIED THAT REQUIREMENT

EPA concedes that it has already made the findings it is puzzling over now.[254] But it also asks for comment on whether the well-supported findings it made in 2016 were "an appropriate methane-specific finding."[255] EPA has no authority to remove a performance standard from a portion of a source category when there exists a valid listing determination for that source category. Instead, according to *Fox Television*, EPA would have to make the countervailing findings that pollutants from this source category do not significantly contribute to air pollution

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[252] 84 Fed. Reg. at 50,266-67.
[253] Regardless, such an interpretation would not affect these sources because EPA did explicitly find that GHG emissions from these source categories significantly contribute to air pollution that endangers health and welfare. *See* section II.A.2, above.
[254] 84 Fed. Reg. at 50,262. ("[I]n both the EGU CO_2 NSPS rule and the [2016 Standard], the EPA also stated that, in the alternative, if it were required to make a pollutant-specific SCF for GHG (with a focus on CO2 and methane, respectively), it was making that finding, citing the same information that it relied on for the rational basis determinations.").
[255] *Id.* at 50,267.

that endangers health and welfare. Moreover, there is no authority allowing the agency to suddenly adopt a vague standard like "appropriateness" to evaluate its previous conclusions.

EPA solicits comments on whether—since it proposes to eliminate, incorrectly, the transmission and storage segment from the source category—the 2016 significant contribution finding "can be considered appropriate in light of the fact that it was based on a greater amount of emissions than are in the source category proposed in this rulemaking."[256] Even if EPA eliminates the transmission and storage segment from the source category, the 2016 significant contribution finding remains appropriate and binding. EPA's 2016 explicit finding that the source category that included transmission and storage met the section 111(b)(1)(A) listing criteria due to its significant GHG emissions was appropriate at the time it was made, and it continues to provide the requisite findings even if EPA reduces the scope of the source category. EPA now calculates that the transmission and storage segment emits 16.8 percent of the source category's total GHG emissions.[257] It would be arbitrary and capricious for EPA to undermine its 2016 significant contribution finding by removing from that source category facilities that emit only a minority of the pollutants, because the bulk of the emissions come from the segments of the category that EPA proposes to retain.

EPA also seeks comment on whether its well-documented 2016 significance finding was "appropriate given that nowhere in the course of developing and promulgating that rule did the EPA set forth the standard by which the 'significance' of the contribution of the methane emissions from the source category (as revised) was to be assessed."[258] There is no evidence that Congress intended EPA to establish such a standard before making a determination. Instead, where Congress wanted EPA to establish a process to regulate sources under section 111, it gave specific instructions to do so. For instance, in contrast with the lack of direction in 111(b)(1)(A), in section 111(d) Congress explicitly directed EPA to issue regulations governing how the agency would develop emission guidelines for existing sources and how it would evaluate and act on state plans for those sources. Further, it has not been EPA's practice for any previous 111(b) rulemakings to first develop an independent set of standards to interpret Congress's direction. All of EPA's dozens of previous 111(b) rulemakings would have been in error if EPA were required to first establish criteria for finding that a source significantly contributed to air pollution. EPA correctly made the significant contribution finding in 2016 even though it did not first develop and specify non-statutory criteria for determining whether methane emissions from the source category were significant.

Finally, even if EPA were to adopt the novel legal positions on which it seeks comment, it may not ignore the factual bases for its 2016 endangerment and significant contribution findings and cannot undo those findings merely by reversing its previous policies and interpretation of its authority. Those new legal positions, "in and of themselves," as EPA put

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[256] 84 Fed. Reg. at 50,267.
[257] *Id.* at 50,271 tbl.7.
[258] 84 Fed. Reg. at 50,267.

it,[259] would not authorize the agency to repeal the 2016 Standard. Although EPA seems to be searching for a way to avoid regulating GHG emissions from this source category on a narrow legalistic ground, it must address the extensive factual record as well before it can repeal existing law. *Fox Television*, 556 U.S. at 516.

V. THE CONSIDERATIONS EPA CURRENTLY AND HISTORICALLY USES TO DETERMINE WHEN A SOURCE'S POLLUTANTS, INCLUDING GHGS, CONTRIBUTE SIGNIFICANTLY TO AIR POLLUTION REMAIN APPROPRIATE.

Without providing any hint as to how it may use them or any context to aid the public's understanding, EPA asks for comment on what criteria are appropriate for it to consider in making a significant contribution finding, both as a general matter, with particular reference to GHG emissions, and with reference to methane emissions from this source category most particularly. Importantly, EPA states that it "does not intend for these comments to inform the finalization of this rule, but rather to inform the EPA's actions in future rules."[260] Prior to finalizing those future, unspecified, hypothetical rules, EPA must provide the undersigned States and Cities, and the public in general, with an opportunity to comment on its specific application of new legal interpretations. EPA cannot attempt to change its interpretation of how section 111(b) applies to particular sources or pollutants without providing the public with notice and an opportunity to comment. EPA's current vague and wholly abstract brainstorming exercise does not meet those standards.[261]

A. EPA Has No Basis For Misinterpreting "Contributes Significantly" to Include a Cost-Effectiveness Prerequisite that Congress Never Mentioned

EPA suggests that, if adequately controlling emissions that endanger public health and welfare seems too expensive to EPA, Congress might not have considered those emissions to be "significant" under section 111(b)(1)(A).[262] EPA has provided no reason to believe that Congress intended EPA to consider the cost of pollution control in making the threshold decision as to whether an air pollutant significantly contributes to the air pollution described in section 111(b)(1)(A). Indeed, doing so would be illogical given the structure of section 111(b)(1)(A), which describes how EPA is to determine which sources to list based on the harm reasonably anticipated to be caused by their pollutants. The examples EPA cites of other parts of the statute that govern wholly different regulatory programs are not relevant to understanding what Congress intended in section 111(b)(1)(A). In addition to the absence of any evidence that Congress intended "contributes significantly" to include a cost component, Congress's specific inclusion of cost considerations in the section 111(a)(1) definition of "standard of performance"

[259] *See* 84 Fed. Reg. at 50,261-62
[260] 84 Fed. Reg. at 50,267.
[261] *See* 42 U.S.C. 7607(d)(3); *Small Refiner Lead Phase-Down Task Force v. EPA*, 705 F.2d at 549; *Shell Oil Co. v. EPA*, 950 F.2d at 760.
[262] 84 Fed. Reg. at 50,268-69.

disproves EPA's suggestion. 42 U.S.C. 7411(a)(1) (requiring EPA to "tak[e] into account the cost of achieving such reduction" when determining the best system of emission reduction); *cf. Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 465-471 (2001) (holding that EPA cannot consider implementation costs when it sets the level of the NAAQS, as decisions about the costs or impacts of NAAQS implementation and how to manage them are made by states in the state implementation plan process).

Similarly, EPA has already rejected the idea that cost-effectiveness is a component of a section 111(b)(1)(A) endangerment finding, based on the considerations described above. In the 2016 Standard, EPA explained:

> Nor does the EPA consider the cost of potential standards of performance in making this finding. Like the endangerment finding under section 202(a) at issue in *State of Massachusetts v. EPA*, 549 U.S. 497 (2007), the pertinent issue is a scientific inquiry as to whether an endangerment to public health or welfare from the relevant air pollution may reasonably be anticipated. Where, as here, the scientific inquiry conducted by the EPA indicates that these statutory criteria are met, the Administrator does not have discretion to decline to make a positive endangerment finding to serve other policy grounds. *Id*. at 532–35.[263]

It would be arbitrary and capricious for EPA to now change its legal position that section 111(b)(1)(A) somehow contains authority to EPA to insert some sort of cost-effectiveness prerequisite into the significant contribution determination. *Fox Television*, 556 U.S. at 516.

B. EPA Should Continue Its Practice of Considering Emissions From a Source Category Overall, Including Both Existing and New Sources

EPA concedes that its historical practice has been to "evaluate[] the emissions from the source category, which includes existing sources, in making the SCF determination, and the D.C. Circuit has upheld that industry-wide approach."[264] It now asks for input on the abstract concept of whether it should abandon its decades-old, court-approved interpretation of section 111 in favor of some other idea someone may supply it with during the comment period.

EPA's current position that significance under section 111(b)(1)(A)'s listing criteria is determined by looking at the source category as a whole, not just expected future sources, is the only interpretation that accords with the Act. Considering the source category as a whole under section 111(b)(1)(A) is the only rational approach under the Clean Air Act because a listing must occur before existing sources can be regulated at all under section 111(d). If, contrary to EPA's

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[263] 81 Fed. Reg. at 35,843 n.73 (citing *Whitman*, 531 U.S. 457 (2001), and describing cost analysis required for a section 111(b) standard of performance).
[264] 84 Fed. Reg. at 50,269 n.85 (citing to *Nat'l Lime Ass'n v. EPA*, 627 F.2d 416, 433 n.48 (D.C. Cir. 1980), and *Nat'l Asphalt Pavement Ass'n v. Train*, 539 F.2d 775, 779–82 (D.C. Cir. 1976)).

suggestion, the agency would only make a listing decision on the basis of whether pollution from new sources in that category were expected to endanger public health or welfare or cause or significantly contribute, then EPA might deprive itself (and states) of the ability to regulate existing sources under section 111(d), regardless of how much of a danger pollution from those existing sources posed. There is no reason to believe that Congress would have structured section 111 to achieve this absurd result. And as described above in this section II, nothing about this source category has materially changed since EPA issued the Current Standard. EPA would have no reasonable basis for reversing this legal position. *Fox Television*, 556 U.S. at 516.

C. EPA Lacks a Reasonable Basis to Change Decades of Practice Under Section 111 and Adopt a Numerical Threshold for the Meaning of "Contribute Significantly"

There is no evidence that Congress gave EPA the authority in section 111(b)(1)(A) to create a non-statutory numerical threshold for determining which harmful emissions "significantly contribute" to air pollution. EPA has listed dozens of source categories under section 111(b) over several decades without the need to resort to a general or pollutant-specific numerical threshold, and EPA has not provided the reasoned explanation required for it to change course now. *Fox Television*, 556 U.S. at 516.

EPA also already explained in 2016 the fallacy of analyzing GHG emissions from a source category and concluding that they are too small for regulation under the Clean Air Act simply because there are many other sources also emitting GHGs:

> Consideration of the global context is important. GHG emissions from United States oil and natural gas production and natural gas processing and transmission will become globally well-mixed in the atmosphere, and thus will have an effect on the United States regional climate, as well as the global climate as a whole for years and indeed many decades to come. As was the case in 2009, no single GHG source category dominates on the global scale. While the oil and natural gas source category, like many (if not all) individual GHG source categories, could appear small in comparison to total emissions, in fact, it is a very important contributor in terms of both absolute emissions, and in comparison to other source categories globally or within the United States.[265]

There is also no indication that Congress intended EPA to develop numerical thresholds to constrain its discretion under section 111(b)(1)(A). By the time of the 1990 Clean Air Act Amendments, EPA had issued dozens of NSPS without articulating any sort of numerical threshold for regulation under section 111(b). If Congress had intended EPA to use a different

[265] 81 Fed. Reg. at 35,840.

framework for making the "significantly contributes" determination under section 111(b)(1)(A), it would not have remained totally silent on this issue in the 1990 Amendments.

Further, the States and Cities are concerned that if EPA tries to exceed its statutory authority and applies a strict numerical threshold, abandoning its own discretion to take other factors into consideration, EPA would be able to prevent regulation of certain sources or pollutants under section 111(b) merely by narrowly defining the source category in question, or by dividing an industry into multiple small segments, in order to ensure that the now-smaller emissions were below whatever threshold EPA determines would trigger regulation. Instead, EPA should retain its discretion to interpret "significantly contributes" according to rational regulatory policy, sound science, and Congressional intent, without using a numerical threshold to artificially constrain the powers Congress gave to it in section 111(b).

VI. Conclusion

For these reasons, the States and Cities strongly oppose EPA's Proposed Rule and respectfully request that EPA withdraw the Proposed Rule in its entirety.

Sincerely,

FOR THE STATE OF CALIFORNIA

XAVIER BECERRA
Attorney General
DAVID A. ZONANA
Supervising Deputy Attorney General
TIMOTHY E. SULLIVAN
Deputy Attorney General
MEREDITH J. HANKINS
Deputy Attorney General

/s/ Kavita P. Lesser
KAVITA P. LESSER
Deputy Attorney General
Office of the Attorney General
300 South Spring Street, Suite 1702
Los Angeles, California 90013
Tel: (213) 269-6605
Email: Kavita.Lesser@doj.ca.gov

FOR THE STATE OF NEW YORK

LETITIA JAMES
Attorney General

/s/ Morgan A. Costello
MORGAN A. COSTELLO
Chief, Affirmative Litigation
Environmental Protection Bureau
New York State Attorney General
The Capitol
Albany, NY 12224
Tel: (518) 776-2392
Email: Morgan.Costello@ag.ny.gov

FOR THE STATE OF COLORADO

PHIL WEISER
Attorney General

/s/ Robyn L. Wille
ROBYN WILLE
Senior Assistant Attorney General
Colorado Department of Law
Natural Resources and Environment Section
Ralph L. Carr Colorado Judicial Center
1300 Broadway, 7th Floor
Denver, Colorado 80203
Tel: (720) 508-6261
Email: Robyn.Wille@coag.gov

FOR THE STATE OF CONNECTICUT

WILLIAM TONG
Attorney General

/s/ Jill Lacedonia
JILL LACEDONIA
MATTHEW I. LEVINE
Assistant Attorneys General
Office of the Attorney General
P.O. Box 120, 55 Elm Street
Hartford, Connecticut 06141
Tel: (860) 808-5250
Email: Jill.Lacedonia@ct.gov

FOR THE STATE OF DELAWARE

KATHLEEN JENNINGS
Attorney General

/s/ Valerie Edge
VALERIE EDGE
Deputy Attorney General
Delaware Department of Justice
102 W. Water Street
Dover, DE 19904
Tel: (302) 257-3219
Email: valerie.edge@state.de.us

FOR THE STATE OF ILLINOIS

KWAME RAOUL
Attorney General

/s/ Jason E. James
JASON E. JAMES
Assistant Attorney General
MATTHEW J. DUNN
Chief, Env. Enf./Asbestos Litig. Div.
Environmental Bureau
69 W. Washington Street, 18th Floor
Chicago, IL 60602
Tel: (312) 814-0660
Email: jjames@atg.state.il.us

FOR THE STATE OF IOWA

THOMAS J. MILLER
Attorney General

/s/ Jacob Larson
JACOB LARSON
Assistant Attorney General
Office of Iowa Attorney General
Hoover State Office Building
1305 E. Walnut Street, 2nd Floor
Des Moines, Iowa 50319
Tel: (515) 281-5341
Email: jacob.larson@ag.iowa.gov

FOR THE STATE OF MAINE

AARON M. FREY
Attorney General

/s/ Laura E. Jensen
LAURA E. JENSEN
Assistant Attorney General
Office of the Attorney General
6 State House Station
Augusta, ME 04333
Tel: (207) 626-8868
Email: laura.jensen@maine.gov

FOR THE STATE OF MARYLAND

BRIAN E. FROSH
Attorney General

/s/ Joshua M. Segal
JOSHUA M. SEGAL
Special Assistant Attorney General
Office of the Attorney General
200 St. Paul Place
Baltimore, MD 21202
Tel: (410) 576-6446
Email: jsegal@oag.state.md.us

FOR THE STATE OF MICHIGAN

DANA NESSEL
Attorney General

/s/ Elizabeth Morrisseau
ELIZABETH MORRISSEAU
Assistant Attorney General
Environment, Natural Resources, and
Agriculture Division
6th Floor G. Mennen Williams Building
525 W. Ottawa Street
P.O. Box 30755
Lansing, MI 48909
Tel: (517) 335-7664
Email: MorrisseauE@michigan.gov

FOR THE STATE OF MINNESOTA

KEITH ELLISON
Attorney General

/s/ Leigh Currie
LEIGH CURRIE
Special Assistant Attorney General
445 Minnesota Street, Suite 900
St. Paul, MN 55101-2127
Tel: (651) 757-1291
Email: leigh.currie@ag.state.mn.us

FOR THE STATE OF NEW JERSEY

GURBIR GREWAL
Attorney General

/s/ Aaron A. Love
AARON A. LOVE
Deputy Attorney General
Environmental Enforcement &
Environmental Justice Section
New Jersey Dept. of Law and Public Safety
25 Market St.
Trenton, NJ 08611
Tel: (609) 376-2762
Email: Aaron.Love@law.njoag.gov

FOR THE STATE OF NEW MEXICO

HECTOR BALDERAS
Attorney General

/s/ William Grantham
WILLIAM GRANTHAM
Assistant Attorney General
201 Third St. NW, Suite 300
Albuquerque, NM 87102
Tel: (505) 717-3520
Email: wgrantham@nmag.gov

FOR THE STATE OF NORTH CAROLINA

JOSHUA H. STEIN
Attorney General

/s/ Asher P. Spiller
ASHER P. SPILLER
Assistant Attorney General
North Carolina Department of Justice
P.O. Box 629
Raleigh, NC 27602-0629
Tel: (919) 716-6400
Email: aspiller@ncdoj.gov

FOR THE STATE OF OREGON

ELLEN F. ROSENBLUM
Attorney General

/s/ Paul Garrahan
PAUL GARRAHAN
Attorney-in-Charge
STEVE NOVICK
Special Assistant Attorney General
Natural Resources Section
Oregon Department of Justice
1162 Court Street NE
Salem, OR 97301-4096
Tel: (503) 947-4593
Email: Paul.Garrahan@doj.state.or.us
Steve.Novick@doj.state.or.us

FOR THE STATE OF RHODE ISLAND

PETER F. NERONHA
Attorney General

/s/ Gregory S. Schultz
GREGORY S. SCHULTZ
Special Assistant Attorneys General
Office of the Attorney General
150 South Main Street
Providence, RI 02903
Tel: (401) 274-4400
Email: gschultz@riag.ri.gov

FOR THE STATE OF VERMONT

THOMAS J. DONOVAN, JR.
Attorney General

/s/ Nicholas F. Persampieri
NICHOLAS F. PERSAMPIERI
Assistant Attorney General
Office of the Attorney General
109 State Street
Montpelier, VT 05609
Tel: (802) 828-3171
Email: nick.persampieri@vermont.gov

FOR THE STATE OF WASHINGTON

ROBERT W. FERGUSON
Attorney General

/s/ Emily C. Nelson
EMILY C. NELSON
Assistant Attorney General
Office of the Attorney General
P.O. Box 40117
Olympia, Washington 98504
Tel: (360) 586-4607
Email: emily.nelson@atg.wa.gov

FOR THE COMMONWEALTH OF
MASSACHUSETTS

MAURA HEALEY
Attorney General

/s/ Melissa Hoffer
MELISSA HOFFER
Chief, Energy and Environment Bureau
MEGAN M. HERZOG
Special Assistant Attorney General
Office of the Attorney General
One Ashburton Place, 18th Floor
Boston, MA 02108
Tel: (617) 727-2200
Email: melissa.hoffer@mass.gov

FOR THE COMMONWEALTH OF PENNSYLVANIA

JOSH SHAPIRO
Attorney General

/s/ Ann R. Johnston
MICHAEL J. FISCHER
Chief Deputy Attorney General
ANN R. JOHNSTON
Senior Deputy Attorney General
Office of Attorney General
14th Floor
Strawberry Square
Harrisburg, PA 17120
Tel: (717) 857-2091
Email: ajohnston@attorneygeneral.gov

FOR THE DISTRICT OF COLUMBIA

KARL A. RACINE
Attorney General

/s/ David S. Hoffmann
DAVID S. HOFFMANN
Assistant Attorney General
Public Integrity Section
Office of the Attorney General

441 Fourth Street, N.W. Suite 650 North
Washington, D.C. 20001
Tel: (202) 442-9889
Email: david.hoffmann@dc.gov

FOR THE CITY OF CHICAGO

MARK A. FLESSNER
Corporation Counsel

/s/ Benna Ruth Solomon
BENNA RUTH SOLOMON
Deputy Corporation Counsel
JARED POLICICCHIO
Supervising Assistant Corporation Counsel
30 N. LaSalle Street, S. 800
Chicago, IL 60602
Tel: (312) 744-7764
Email: Benna.Solomon@cityofchicago.org
Jared.Policicchio@cityofchicago.org

FOR THE CITY AND COUNTY OF DENVER

KRISTIN M. BRONSON
City Attorney

/s/ Lindsay S. Carder
LINDSAY S. CARDER
EDWARD J. GORMAN
Assistant City Attorneys
201 W. Colfax Avenue, Dept. 1207
Denver, Colorado 80202
Tel: 720-913-3275
Email: lindsay.carder@denvergov.org

FOR THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

/s/ Jill Ryan
JILL HUNSAKER RYAN
Executive Director
John Putnam
Director of Environmental Programs
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, Colorado 80246

Enclosures[266]

[266] The States and Cities have submitted via overnight mail two USB flash drives containing Attachments 1 – 15.

CALIFORNIA
AIR RESOURCES BOARD

Gavin Newsom, Governor
Jared Blumenfeld, CalEPA Secretary
Mary D. Nichols, Chair

Comments of the California Air Resources Board

Responding to

The United States Environmental Protection Agency

Request for Comment on Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review

Docket No. EPA-HQ-OAR-2017-0757

The California Air Resources Board (CARB)[1] opposes the United States Environmental Protection Agency (U.S. EPA)'s efforts to rollback air pollution standards for the oil and natural gas industry, which are described in the Notice of Proposed Rulemaking: "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review," 84 Fed. Reg. 50,244, Docket Identification Number EPA-HQ-OAR-2017-0757 (hereafter "Proposed Rule" or "Proposal"). The Proposal, if finalized, would increase air pollution by removing the entire transmission and storage sector from U.S. EPA's regulated source category, resulting in emissions increases. It would also end federal efforts to regulate methane from new and existing oil and natural gas sources, even though the industry emits so much methane that this pollution dwarves the emissions of entire countries. This Proposal is illegal, and unwarranted at this time of growing climate crisis.

CARB administers a successful statewide air pollution regulation for the oil and natural gas industry. But federal regulations are also necessary: The industry is a substantial source of air pollution nationwide and federal regulations provide important additional enforcement oversight within California. California's successful implementation of its regulation simply demonstrates the feasibility of the 2016 federal rule that U.S. EPA now seeks to roll back. U.S. EPA should be spending its resources implementing such rules, rather than rolling back requirements already in force.

California's Attorney General, along with several other jurisdictions' Attorneys General, will also be submitting comments opposing the Proposal. CARB agrees with the substance of those legal comments and focuses here primarily on the many technical problems with U.S. EPA's proposal. CARB previously submitted comments on U.S. EPA's notice of reconsideration and partial stay of the NSPS, proposed stays of NSPS compliance deadlines and related Notices of Data

[1] CARB is the expert agency charged with overseeing all air pollution control efforts in California to attain and maintain health-based air quality standards. CARB's mission is to promote and protect public health, welfare, and ecological resources through effective reduction of air pollutants while recognizing and considering effects on the economy.

Availability, and proposed "reconsideration amendments,"[2] and incorporates those comments herein.

Introduction

Three years have passed since U.S. EPA finalized its "Emission Standards for New, Reconstructed, and Modified Sources," 81 Fed. Reg. 35,824, at 40 Code of Federal Regulations (C.F.R.) part 60, subpart OOOOa (hereafter "New Source Performance Standards," or "NSPS"). The current NSPS is achievable, appropriate, and not in need of amendment, as California, other state and local regulators, and industrial actors are actively demonstrating.

The NSPS protects public health and the environment by reducing uncontrolled emissions of air pollutants, including toxic pollutants with carcinogenic and other health impacts; criteria pollutants that contribute to formation of smog and regional haze and endanger respiratory and cardiovascular health; and methane, a greenhouse gas (GHG) with approximately 86 times the heat-trapping power of carbon dioxide on a 20-year timeframe. The necessity of the methane reductions provided by the NSPS is underscored by the recent Fourth National Climate Assessment: Impacts, Risks, and Adaptation in the United States[3] and Intergovernmental Panel on Climate Change Special Report on Global Warming of 1.5 Degrees Celsius.[4]

The benefit provided by the NSPS significantly outweighs its limited and reasonable burden. The NSPS requirements are minimally costly, especially when viewed as a percentage of industry revenues or profits. They are consistent with actions that good industry operators are already taking, as all of the technologies or practices required in the NSPS are readily available and have been for years.

I. State regulations demonstrate the federal rules are feasible and necessary

The feasibility and cost-effectiveness of California's Oil and Gas Regulation,[5] which is very similar to the NSPS, demonstrate that U.S. EPA and state governments can successfully regulate this sector and these emissions.

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[2] *See* Docket ID No. EPA-HQ-OAR-2017-0346-0331 (Aug. 9, 2017) (commenting on 82 Fed. Reg. 25,730 (June 5, 2017)); Docket ID No. EPA-HQ-OAR-2010-0505-12246 (Aug. 9, 2017) (commenting on 82 Fed. Reg. 27,641, 27,645 (June 16, 2017)); Docket ID No. EPA-HQ-OAR-2017-0346-0418 (Dec. 8, 2017) (commenting on 82 Fed. Reg. 51,794, 51,788 (Nov. 8, 2017)); Docket ID No. EPA-HQ-OAR-2017-0483-0785 (Dec. 17, 2018) (commenting on 83 Fed. Reg. 52,056 (Oct. 15, 2018)).
[3] U.S. Global Change Research Program, Fourth National Climate Assessment, Vol. II: Impacts, Risks, and Adaptation in the United States: Overview (2018), *available at* https://nca2018.globalchange.gov.
[4] Intergovernmental Panel on Climate Change (IPCC), Special Report on Global Warming of 1.5°C (2018), *available at* https://report.ipcc.ch/sr15/index.html.
[5] 17 Cal. Code Regs. §§ 95665–77.

California's local air districts, like many regulators across the country, have been controlling volatile organic compounds (VOCs) and other pollutants from the industry with these methods for decades, and are now working with CARB to implement statewide methane control rules. Industry is highly familiar with these approaches, has the necessary equipment, and can implement controls cost-effectively. California's oil and natural gas industry has not experienced substantial implementation issues, with over 300 operators in the state, ranging from the very small "mom and pop" variety to large global companies. Methane-specific regulations such as the NSPS build upon this long regulatory and industry experience.

CARB has successfully implemented its Oil and Gas Regulation, which went into effect on October 1, 2017. To date, all covered facilities (over 700) have met their requirements to report facility and equipment information.[6] Over 200 of these facilities were additionally required to submit their quarterly leak detection and repair (LDAR) data, and all have done so.[7] All 12 underground storage facilities in the state have begun implementing their additional daily or continuous wellhead LDAR monitoring and reporting, as well as their ambient air monitoring of methane.[8] The widespread conducting and reporting of quarterly, and in some cases daily or continuous, LDAR surveys in California demonstrate that the LDAR requirements in the NSPS are achievable.

Many of California's requirements are even more stringent than the NSPS. For example, California's Oil and Gas Regulation requires LDAR inspections of all wells, regardless of production,[9] and quarterly inspections of wellhead-only well sites,[10] while the NSPS only requires semiannual inspections of well sites and exempts wellhead-only well sites from monitoring requirements.[11] California's own experience shows such controls are feasible.

Indeed, *national* compliance with current U.S. EPA regulations supports this conclusion. The NSPS and co-promulgated Information Collection Request (ICR) require regulated entities to submit annual compliance reports to U.S. EPA, including

[6] 17 Cal. Code Regs. § 95674(b)(2), requiring owners/operators of regulated facilities or equipment to register all of the covered equipment by reporting information to CARB or the local air district, including (a) the number of crude oil or natural gas wells; (b) identification of all pressure vessels, tanks, separators, sumps, and ponds at the facility, including the size of each tank and separator in units of barrels; (c) annual crude oil, natural gas, and produced water throughput; (d) identification of all reciprocating and centrifugal natural gas compressors; and (e) a count of all natural gas powered pneumatic devices and pumps.
[7] 17 Cal. Code Regs. § 95669.
[8] 17 Cal. Code Regs. § 95668(h).
[9] 17 Cal. Code Regs. § 95669.
[10] 17 Cal. Code Regs. § 95669.
[11] *See* 40 C.F.R. §§ 60.5397a(g), 60.5365a(i)(2).

reporting about regulated entities' compliance with the NSPS LDAR.[12] U.S. EPA has publicly released reports that represent only a small fraction of the facilities subject to the NSPS and ICR reporting requirements.[13] Despite this, a preliminary analysis of the released reports demonstrates that over 2,000 facilities reported meeting the NSPS LDAR requirements.[14] Like California and other jurisdictions' success in implementing similar or more rigorous regulations, this widespread compliance undermines U.S. EPA's claims that NSPS compliance is infeasible or unduly burdensome.

U.S. EPA cannot simply point to California and other state regulations and walk away from its obligations under the Clean Air Act. We need strong national rules to complement California's efforts. Approximately 90 percent of the natural gas consumed in California is imported from out-of-state. As discussed in more detail later in these comments, federal rules in California would add important additional layers of enforcement and oversight. Federal rules provide needed federal oversight of national and international corporations operating in California. Federal rules impose reporting requirements that provide valuable emissions inventory data—data not easily replicated by California's efforts alone. Federal rules ensure that imported natural gas has similar rates of methane emissions to that of natural gas produced within California, and assist CARB in its efforts to reduce greenhouse gas emissions through state rules and address life-cycle greenhouse gas emissions through its Low Carbon Fuel Standard Program. Californians, particularly the most vulnerable populations and communities, experience the climate impacts of methane waste from out-of-state oil and natural gas operations.

II. The specific proposed amendments are arbitrary, insufficiently explained, and unsupported by the record

Despite the demonstrated success of emissions control programs, U.S. EPA is proposing to shrink controls for new and modified sources, while entirely abandoning controls for existing sources (which emit the lion's share of pollution). This proposal

[12] 81 Fed. Reg. 35,824 (June 3, 2016); U.S. EPA ICR No. 2523.01c, RIN 2060-AS30, *available at* https://www.reginfo.gov/public/do/PRAViewDocument?ref_nbr=201807-2060-002.
[13] U.S. EPA made a small fraction of compliance reports publicly available in response to a Freedom of Information Act (5 U.S.C. § 552) request submitted by a number of jurisdictions, including California. *See* FOIA Online, FOIA Request EPA-HQ-2018-001886 Details, https://www.foiaonline.gov/foiaonline/action/public/submissionDetails?trackingNumber=EPA-HQ-2018-001886&type=request. A small number of reports that were submitted via U.S. EPA's Compliance and Emissions Data Reporting Interface are also available on U.S. EPA's public WebFIRE database. *See also* Letter from the State of California, CARB, et al., to Acting Administrator Wheeler (Nov. 19, 2018) (regarding a request for the remainder of the submitted compliance reports and a related extension of the deadline to comment on the proposed amendments).
[14] *See* FOIA Online, FOIA Request EPA-HQ-2018-001886 Details, https://www.foiaonline.gov/foiaonline/action/public/submissionDetails?trackingNumber=EPA-HQ-2018-001886&type=request.

departs sharply from U.S. EPA's prior positions and from the evidence. This agency action is arbitrary and capricious, in violation of sound administrative procedure.[15]

Changes in agency policy positions are permissible only when the agency provides reasoned justification for the change. This includes a reasoned explanation for its rejection of any previous factual findings: "In such cases it is not that further justification is demanded by the mere fact of policy change; but that a reasoned explanation is needed for disregarding facts and circumstances that underlay or were engendered by the prior policy."[16]

U.S. EPA's Proposed Rule fails on multiple fronts. U.S. EPA demonstrates no factual basis for rejecting or revising the conclusions set forth in the rulemaking record for the NSPS. U.S. EPA entirely fails to consider important aspects of the issues, offers justifications that run counter to the evidence before the agency, and insufficiently explains the reasons for its change and rejection of earlier determinations.

Additionally, U.S. EPA attempts to frame the Proposed Rule as merely a less-beneficial regulatory option to compare to the NSPS (or to a baseline that incorporates the 2018 proposed NSPS amendments), rather than a new and separate deregulatory action with new and significant impacts. For example, U.S. EPA writes, "The 2016 NSPS OOOOa . . . <u>was</u> anticipated to reduce emissions of methane, VOC, and HAP, and some of the benefits of reducing these pollutants <u>would have</u> accrued to children."[17] However, U.S. EPA is required to analyze these impacts by comparison to the status quo, not a period before U.S. EPA promulgated the NSPS (or after U.S. EPA finalizes a different proposal).

A. U.S. EPA fails to justify its proposal to omit the transmission and storage segment from the source category

U.S. EPA fails to provide evidence in support of its proposed removal of the transmission and storage segment from the Crude Oil and Natural Gas Production source category. The production, processing, and transmission and storage segments have extensive overlap in types of control requirement and pollutant reductions. Nothing in the statute—which requires comprehensive pollution controls—justifies ignoring pollution from half of the sector's processes, even if U.S. EPA's chemical composition claims were accurate.

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[15] *See, e.g.*, *Nat'l Envtl. Dev. Ass'n's Clean Air Project v. E.P.A.*, 686 F.3d 803, 809–10 (D.C. Cir. 2012) ("Under the CAA, we will set aside the Agency's determination only if it is arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." (internal quotation omitted)); *Ethyl Corp. v. EPA*, 51 F.3d 1053, 1064 (D.C.Cir.1995) (holding that the arbitrary and capricious standard under the CAA is interpreted in "essentially the same" way as the same standard under the APA).
[16] *F.C.C. v. Fox Television Stations, Inc.*, 556 U.S. 502, 515–16 (2009) (internal citation omitted).
[17] 84 Fed. Reg. at 50,282 (emphasis added).

Those claims are, moreover, incorrect: U.S. EPA claims, "the transmission and storage operations are distinct from production and processing operations because the natural gas that enters the transmission and storage segment has different composition and characteristics than the natural gas that enters the production and processing segments."[18] While U.S. EPA compares the average composition of the production segment to the average composition of the transmission segment, the agency fails to consider the extensive overlap in the range of compositions in both segments.[19, 20] U.S. EPA's own memo on the topic presents data showing the wide range of compositions of gas in the production and transmission sectors.[21] In the production sector, methane content ranged from 65.7 percent to 97.2 percent, while in the transmission sector the methane content varied from 91.9 percent to 95.2 percent .VOCs in the production sector ranged from 1.2 to 5.7 percent, compared to 0.2 to 6.8 percent in the transmission sector. The data U.S. EPA shows from 2011 demonstrates a wide range of compositions in both the production and transmission sectors, but the Proposal discusses only average values and omits consideration of ranges. The range of methane compositions in the production sector fully encompasses the range in the transmission sector, demonstrating the similarity of the gas composition in the two sectors. Similarly, there is extensive overlap between the sectors' VOC compositions. Therefore, U.S. EPA's data supports retaining the transmission and storage segment in the source category because the composition of the natural gas is similar to that of the production and processing segments.

U.S. EPA's more recent data from a 2018 memorandum only contains updated composition data for the production segment.[22] Methane content in natural gas from all wells (including gas wells and oil wells with associated gas) ranged from 17.5 percent to 98.4 percent while VOC content ranged from zero to 40.9 percent. This data shows even more variation in composition than the 2011 data, further supporting the point that there is extensive overlap between the production and processing segments and the transmission and storage segment. The 2018 memorandum did not include any updated data for the transmission and storage segment; however, given the significant difference in the production segment data from 2011 and 2018, U.S. EPA must collect more current data for the transmission and storage segment if it seeks to justify any claims about the segment being sufficiently distinct from production and processing to warrant revision of the source category. But even such

[18] 84 Fed. Reg. at 50,257.
[19] 84 Fed. Reg. at 50,258.
[20] U.S. EPA omits discussion of the storage segment, but the composition of gas in the storage segment should be equivalent to the composition of gas in the transmission segment, as storage gas is transmission gas in storage.
[21] Composition of Natural Gas for use in the Oil and Natural Gas Sector Rulemaking, July 28, 2011.
[22] Natural Gas Composition, November 13, 2018.

chemical differences, if they existed, would not explain why common controls and common regulations should not still apply.

In addition to the similarities in natural gas composition between the production, processing, and transmission and storage segments, the extensive overlap in the equipment and operations between segments demonstrate the unity of the sector and the utility of the existing regulatory regime—which treats the sector as fair ground for regulation. All three segments include natural gas compressors and natural gas-powered pneumatic controllers used to compress gas and operate or control valves. For example, gathering and boosting stations in the production segment and transmission compressor stations in the transmission and storage segment both move natural gas at increased pressure through pipelines, or into or out of storage. The shared definition of compressor station in the NSPS reflects this similarity: A compressor station includes both gathering and boosting stations and transmission compressor stations. U.S. EPA acknowledges the similar equipment used across the industry in the Proposal, but states that "the differences in the operations of, and the emission profiles of, the different segments are more significant and support our proposal to exclude the transmission and storage segment from the source category."[23] However, U.S. EPA fails to demonstrate differences in compressor and pneumatic controller operations between the segments.

In the 2016 NSPS rulemaking, U.S. EPA stated, "the inclusion of the transmission and storage segment into the original 1979 source category was warranted because equipment and operations at production, processing, transmission and storage facilities are a sequence of functions that are interrelated and necessary for getting the recovered gas ready for distribution."[24] U.S. EPA now attempts to refute this point, stating that the transmission and storage operations are distinct because of differing composition and characteristics of natural gas between the segments.[25] However, U.S. EPA does not dispute the interrelatedness of the segments. U.S. EPA's point in 2016 regarding the interconnectedness of the transmission and storage segment with the rest of the source category remains true today; the transmission and storage segment is a necessary element of the source category because it prepares the recovered gas for distribution. Without transmission and storage, gas obtained from the production and processing segments could not be distributed to its end users.

B. U.S. EPA fails to consider the impacts of rescinding standards for the transmission and storage sector

U.S. EPA's premises are not just wrong—they would create harmful emissions increases if they were followed. U.S. EPA provides limited and flawed evidence to

[23] 84 Fed. Reg. at 50,258.
[24] 84 Fed. Reg. at 50,255.
[25] 84 Fed. Reg. at 50,257.

justify its proposal to rescind the NSPS for transmission and storage sources; a fair look at the sector raises concerns that U.S. EPA's proposal would increase pollution exposure, contrary to its statutory obligation to ensure standards operate in accordance with the best system of emission reduction.

U.S. EPA's calculations are spotty and unconvincing. It states that the lack of storage vessels emitting more than 6 tons of VOC per year in the transmission and storage segment supports their understanding that VOC emissions in the transmission and storage segment are lower than the production segment.[26] This argument is misleading because there are many fewer storage vessels in the transmission and storage segment compared to the production and processing segments. Furthermore, U.S. EPA fails to mention that the transmission and storage segment has equipment, such as pneumatic controllers and compressors, which are potentially sources of VOCs. In the proposed revised Information Collection Request (ICR) corresponding to the Proposed Rule's reporting requirements, U.S. EPA does not even include storage vessels in their calculations of changes in burden for recordkeeping and reporting requirements due to the proposed rescission of the NSPS for the transmission and storage sector: U.S. EPA focuses exclusively on centrifugal compressors, reciprocating compressors, and pneumatic controllers.[27] U.S. EPA presents a misleading argument by focusing on VOC emissions from storage vessels rather than other equipment that is more widespread in the transmission and storage segment.

In addition to VOCs, the transmission and storage segment is a source of HAP emissions. While U.S. EPA presents data on VOC and HAP emissions in the transmission and storage segment, it fails to provide any context regarding what level of emissions would be dangerous to human health.[28] Indeed, while U.S. EPA notes that "just a few pounds of some metals (i.e., Hexavalent Chromium) is more toxic than a ton of benzene" (another HAP),[29] the agency fails to estimate the quantities of different HAPs likely emitted as a result of the Proposed Rule or estimate the impacts of any HAP emissions.

The HAP emission data that U.S. EPA does include is conflicting, and likely incorrect. According to U.S. EPA, the transmission and storage segment emitted 1,143 tons of HAP in 2014.[30] However, U.S. EPA also claims that the primary proposal will lead to an increase in HAP emissions of 300 tons from 2019 to 2025 relative to the current regulatory baseline. Given the 2014 emissions, if U.S. EPA removes regulatory requirements from the transmission and storage segment, we expect HAP emissions

[26] 84 Fed. Reg. at 50,258.
[27] Draft Supporting Statement Oil and Gas Review 2060-AT90, p. 12.
[28] 84 Fed. Reg. at 50,259.
[29] Regulatory Impact Analysis for the Proposed Oil and Natural Gas Sector Emission Standards for New, Reconstructed, and Modified Sources Review (RIA), Aug. 2019, Docket ID No. EPA-HQ-OAR-2017-0757-0004, p. 3–21.
[30] 84 Fed. Reg. at 50,259.

would increase significantly—to more than 300 tons over 6 years. Using U.S. EPA's 2014 emissions as an estimate for each year from 2019 to 2025, the estimated emissions increase should be closer to 7,000 tons.

Rescinding the NSPS for sources in the transmission and storage segment would also have a significant impact on nationwide methane emissions. Pursuant to CARB's Oil and Gas Methane Regulation, oil and natural gas facilities in California, including natural gas underground storage facilities, are required to conduct quarterly LDAR surveys of all components and report the results to CARB annually.[31] Preliminary data from operators reporting for 2018 show that over 2,600 leaks were discovered and repaired at 11 natural gas underground storage facilities, with an average concentration before repair of over 40,000 parts per million, and less than 200 parts per million after repair. This demonstrates that regulatory LDAR programs are effective at reducing emissions. Furthermore, the reporting data shows the extent of leaks occurring in the storage segment, highlighting the need for continued regulation of the segment nationwide by the NSPS.

These gaps are of considerable importance to Californians, if they were to be reflected in weakened federal rules. Federal rules provide important additional enforcement oversight even in states with their own state rules by creating obligations under the federal Clean Air Act that may be enforced by U.S. EPA or citizen suit—and, of course, matter a great deal nationally where other rules are not in force. Although California's Oil and Gas Methane Regulation would still regulate the transmission and storage segment in California,[32] California imports approximately 90 percent of the natural gas the state uses. Therefore, under the Proposed Rule, the imported gas could have a significantly higher rate of methane emissions before its importation into California. The carbon impact of gas imported to California would increase, undermining state and national efforts to reduce greenhouse gas emissions.

If U.S. EPA rescinds the NSPS for the transmission and storage sector, sources in that sector would no longer be subject to the NSPS's recordkeeping or reporting requirements. Regulatory reporting requirements provide valuable emissions information that is useful for many programs, including emissions inventories. California utilizes emissions inventories to estimate greenhouse gas emissions associated with imported natural gas pursuant to state law.[33] The proposed elimination of reporting requirements for the transmission and storage segment would negatively impact these efforts.

[31] 17 Cal. Code Regs. §§ 95669, 95673.
[32] 17 Cal. Code Regs. §§ 95665–77.
[33] Cal. Health and Safety Code section 39607 (amended by Assembly Bill 2195, Chap. 371, Stats. 2018).

C. U.S. EPA fails to justify its rescission of methane requirements and fails to disclose its impetus

U.S. EPA also proposes to drop methane control requirements entirely from its current rule, claiming that the Proposed Rule is intended to "remov[e] regulatory duplication"[34] and to "provide for greater clarity by simplifying" the NSPS.[35] U.S. EPA states that the methane requirements for the production and processing segments "are entirely redundant with the existing NSPS for VOCs, establish no additional health protections, and are, thus, unnecessary."[36] U.S. EPA misrepresents both the law and the technology at issue.

As noted above, the CAA gives agencies the onus of justifying amendments to duly promulgated regulations. Agencies may only reverse policy positions by providing reasoned justification for the change, and "the requirement that an agency provide reasoned explanation for its action would ordinarily demand that it display awareness that it is changing position."[37] Even if the NSPS's methane requirements were entirely redundant to its VOC provisions, therefore, U.S. EPA may not summarily jettison the methane requirements as it proposes. As it turns out, the controls are not redundant and—critically—are necessary to regulate *existing* sources. That means that abandoning them would functionally exempt a huge portion of the industry from federal methane regulation, with consequences for emissions wholly contrary to the Clean Air Act's pollution control mandates.

Methane controls are not redundant, even with regard to new and modified sources that are also controlled for VOCs. The NSPS does not simply duplicate requirements for emission controls; rather, it allows, but does not require, operators to comply with both VOC and methane controls using the same practices. U.S. EPA asserts that the NSPS's methane and VOC controls are redundant because "[t]he capture and control devices that the emission sources use to meet the NSPS requirements are the same for these co-pollutants and are not selective with respect to either VOC or methane emissions."[38] While this is generally the case at present, such selective technologies do exist, and could be applied to reduce VOC but not methane emissions if the methane rescission is finalized. For example, activated carbon adsorbers control VOCs but not methane: the technology is useful for removing VOCs from gaseous streams, but methane is a very weakly adsorbed compound. [39] Industry does not currently use this technology to comply with the NSPS. But industry could potentially use this technology to comply cost-effectively with a VOCs-only NSPS if U.S. EPA finalizes its

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[34] 84 Fed. Reg. at 50,246.
[35] 84 Fed. Reg. at 50,254.
[36] 84 Fed. Reg. at 50,259.
[37] *Fox Television Stations*, 556 U.S. at 515.
[38] 84 Fed. Reg. at 50,259.
[39] Activated Carbon Adsorption for Treatment of VOC Emissions, available: https://www.carbtrol.com/images/white-papers/voc.pdf.

proposed methane rescission. U.S. EPA also acknowledges new technologies currently under development that "would detect speciated fugitive emissions from oil and natural gas operations,"[40] potentially allowing operators to comply with a VOCs-only NSPS by controlling VOCs while leaving methane emissions unabated. U.S. EPA thus fails to consider the impact of these VOC-only technologies to future methane emissions in the absence of the current NSPS.

D. U.S. EPA fails to consider the impact of non-regulation of existing sources.

U.S. EPA's proposal attempts to evade an important distinction between the VOC and methane NSPS: controls of existing sources. While U.S. EPA acknowledges that Clean Air Act section 111(b), concerning new and modified sources, applies to both VOCs and methane, U.S. EPA states that Clean Air Act section 111(d), concerning existing sources, applies to methane but not to VOCs.[41] As VOCs are an ozone precursor, U.S. EPA argues, VOCs from existing sources are controlled under Clean Air Act sections concerning NAAQS and their precursors.[42] While U.S. EPA is required to develop emissions guidelines under section 111(d) for methane controlled under section 111(b), U.S. EPA asserts that it need only provide state and local regulators with information on possible control options, in the form of "Control Technique Guidelines," for existing sources of VOCs.[43] As such, U.S. EPA asserts that rescinding the methane NSPS would leave existing oil and natural gas sources unregulated at the federal level under CAA section 111(d).[44] Thus, under U.S. EPA's reasoning, one of the largest U.S. sources of methane pollution would escape regulation, at the very time that the climate crisis requires emissions control. U.S. EPA has determined that this crisis endangers public health and welfare; it may not legally shirk its obligation to take action.

U.S. EPA concedes that the proposed methane rescission, alternately, would "obviate the need for the development of emission guidelines under CAA section 111(d) and 40 CFR part 60, subpart B to address methane emissions from existing sources within

[40] 84 Fed. Reg. at 50,260.
[41] 84 Fed. Reg. at 50,272. Sec. 111(d): "(1) The Administrator shall prescribe regulations which shall establish a procedure similar to that provided by section 7410 of this title under which each State shall submit to the Administrator a plan which (A) establishes standards of performance for any existing source for any air pollutant (i) for which air quality criteria have not been issued or which is not included on a list published under section 7408(a) of this title or emitted from a source category which is regulated under section 7412 of this title but (ii) to which a standard of performance under this section would apply if such existing source were a new source, and (B) provides for the implementation and enforcement of such standards of performance."
[42] CAA §§ 108, 182(b)(2)(A), 183(c)–(e), and 184(b).
[43] Sec. 108(b). Additionally, U.S. EPA has proposed to withdraw its Control Technique Guidelines for VOC emissions from this sector.
[44] 84 Fed. Reg. at 50,259.

the crude oil and natural gas production industry[,]"[45] and would "mean that existing sources of the same type in the source category will not be subject to regulation under CAA section 111(d)."[46] However, U.S. EPA shrugs, "this is a legal consequence that results from the application of the CAA section 111 requirements."[47] U.S. EPA barely bothers to profess that this outcome is a side effect of its unrelated effort to reduce "regulatory duplication," and not the intent of the proposal. It may not ignore these impacts. Section 111 is an integrated emissions control program, such that existing sources of dangerous pollutants must also be controlled. Breaking that program by declining to regulate those pollutants for new and modified sources is not a "side effect"; it thwarts Congress's direction to ensure the public is protected from dangerous pollutants from Section 111 source categories, whether sources are new or existing. U.S. EPA must reckon with the consequences of the decision it is proposing to take.

Clean Air Act section 307(d) requires U.S. EPA to provide "the major legal interpretations and policy considerations underlying the proposed rule," and the CAA permits changes in agency policy positions only when the agency provides reasoned justification for the change. Here, U.S. EPA has done neither.

Additionally, as noted above, rulemaking violates the Administrative Procedure Act—and similarly here, the CAA—"if the agency has . . . entirely failed to consider an important aspect of the problem[.]"[48] U.S. EPA has declined to consider the direct, and undoubtedly intentional, impact of its proposed methane rescission on its current obligation to regulate existing sources. While U.S. EPA claims that "[a]nalysis of potential impacts of removing the requirement to regulate existing sources under 111(d) is outside the scope . . . and would be speculative[,]"[49] U.S. EPA's refusal to consider these impacts renders its proposal unlawful.

U.S. EPA attempts to downplay the likely impact from its non-regulation of existing sources, claiming, "the lack of regulation of existing sources under CAA section 111(d) will not mean a substantial amount of lost emission reductions."[50] However, U.S. EPA fails either to define what it means by "substantial" or to provide evidence to support this claim.

[45] 84 Fed. Reg. at 50,254.
[46] 84 Fed. Reg. at 50,272.
[47] 84 Fed. Reg. at 50,272.
[48] *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).
[49] Regulatory Impact Analysis for the Proposed Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review, August 2019, EPA-452/R-19-001, p. 1–3.
[50] 84 Fed. Reg. at 50,271.

III. Assertions that existing-source regulations are unnecessary are contradictory and unsupported

U.S. EPA provides a long list of reasons that regulation of existing sources is unnecessary, none of which are supported, and some of which are undermined, by U.S. EPA's own data.

U.S. EPA asserts that existing-source regulations are unnecessary because existing sources become subject to the NSPS when they undergo modification. The agency purports to qualitatively support its claim by stating that the NSPS's "very broad" "definition and approach to determining new source applicability . . . can be anticipated to result in wide applicability of the NSPS to existing sources due to the frequency with which such sources can be reasonably expected to engage in 'modification' activity."[51] U.S. EPA has both Title V permits and three years of new source reporting under the NSPS, which it presumably would cite if the data supported this claim. However, U.S. EPA provides no data demonstrating the frequency that sources have engaged in modification activity that renders them subject to the NSPS.

U.S. EPA posits that "it is reasonable to expect that the number of existing sources may decline over time due to obsolescence or to shut down and removal actions."[52] However, U.S. EPA presents only data contrary to this hypothesis. When discussing equipment turnover rates, U.S. EPA states that "if many existing storage vessels were being replaced . . . we may expect production throughput at large uncontrolled storage tanks to decline, with corresponding increases at controlled tanks."[53] The proposal notes, "Oil production throughput at large storage vessels without controls increased by 18 percent from 2011 to 2017."[54] Moreover, U.S. EPA has proposed to freeze or roll back the stringency of federal GHG emissions standards for light-duty vehicles, conceding in that proposal that increased U.S. oil and natural gas production would result. Thus, the premises of this rulemaking are strongly contradicted by U.S. EPA's other actions. If U.S. EPA finalizes the light-duty vehicle rollback, it cannot maintain that emissions from the oil and natural gas sector will decline. These statements and actions further undermine U.S. EPA's unsupported claims.

U.S. EPA also claims, without evidence, that the lack of federal regulation of existing sources will not result in "a substantial amount of lost emission reductions" because existing sources will be retired, will undergo modifications and become subject to the

[51] 84 Fed. Reg. at 50,273.
[52] 84 Fed. Reg. at 50,273.
[53] 84 Fed. Reg. at 50,273.
[54] 84 Fed. Reg. at 50,273.

NSPS, or will have their emissions controlled or reduced by other federal regulations, state regulations, voluntary programs, and market forces.[55]

The other federal regulations on which U.S. EPA relies are a Bureau of Land Management regulation that has been repealed (and that only applied to federal and Indian lands while it was in effect),[56] and safety regulations that EPA merely says "likely [have] a corresponding environmental co-benefit[.]"[57]

Despite asserting that state regulations adequately reduce emissions from existing sources, U.S. EPA solicits comment describing, "whether there are enough consistent state regulations in place that will meaningfully reduce emissions should the primary proposal be finalized."[58] U.S. EPA fails to define "meaningfully reduce emissions" or explain why this is the standard—as no such requirement appears in statute. While U.S. EPA claims, "many of the top oil and natural gas-producing states have developed or are developing regulations that require emissions reductions,"[59] U.S. EPA does not provide quantitative analysis of state requirements.

In any event, the Clean Air Act explicitly directs U.S. EPA, not the states, to impose appropriate control requirements (per Section 111); moreover, 42 U.S.C. § 7401, the first section of the Act, directs U.S. EPA to be a good and supportive partner to the states. Declining to implement federal standards functionally shifts obligations to the states, contrary to the Act's cooperative federalism design and contrary to U.S. EPA's specific statutory mandate in Section 111 to set appropriately stringent federal baseline standards. Setting such standards is particularly important here to avoid races to the bottom among the states on oil and natural gas regulatory stringency, and to ensure that production is controlled appropriately across the entire national oil and natural gas system. This task is quintessentially federal, and may not be shrugged off just because some states have been forced to fill gaps left by federal inaction.

Table 9 of the Proposal preamble provides a list of States that regulate emissions from any affected source, many of which only regulate a subset of the types of sources. U.S. EPA asserts that the listed States "contributed about 71 percent of crude oil production and 69 percent of natural gas production" in 2018, but does not expressly

[55] 84 Fed. Reg. at 50,271 and 50,253–254.
[56] 84 Fed. Reg. at 50,253–54. U.S. EPA notes BLM's 2018 "amendments to reduce compliance burden" without acknowledging that they actually comprised a wholesale rescission of the rule. *See* Waste Prevention, Production Subject to Royalties, and Resource Conservation; Rescission or Revision of Certain Requirements, 83 Fed. Reg. 49,184 (Sept. 28, 2018).
[57] 84 Fed. Reg. at 50,254, referencing Pipeline and Hazardous Materials Safety Administration regulations.
[58] 84 Fed. Reg. at 50,277.
[59] 84 Fed. Reg. at 50,274.

acknowledge that the listed States regulated a far smaller percentage of sources than the NSPS.[60]

As part of the proposed 2018 NSPS amendments, U.S. EPA published a memorandum comparing various State fugitive emissions programs for well sites and compressor stations to the proposed revisions to determine which state programs were equivalent to the proposed rule.[61] CARB's comments on the proposed 2018 NSPS amendments identified deficiencies in the State equivalency memorandum, including U.S. EPA's failure to quantify emission reductions from the States' rules and perform a more detailed comparison than qualitative program components, rendering the equivalency determinations unjustified. Additionally, CARB explained that because the 2018 proposed NSPS amendments themselves are unlawful and impermissible, U.S. EPA cannot extend alternative means of emission limitation (AMEL) to state programs that are equivalent only to the 2018 proposed amendments but not the existing NSPS. U.S. EPA proposed in the 2018 proposed amendments that only the State LDAR programs of California, Colorado, Ohio, Pennsylvania, Texas,[62] and Utah are equivalent to the proposed 2018 amended NSPS.[63] Comparing these LDAR equivalency determinations to the Proposed Rule, U.S. EPA attempts to rely on the State programs of four States (Montana, North Dakota, New Mexico, and Wyoming) with regulatory programs that the agency has determined are less stringent than the proposed 2018 NSPS amendments, let alone the existing NSPS. In addition to being unsupported, U.S. EPA's claim that these States' programs compensate for federal non-regulation of existing sources is disingenuous.

By contrast, the States that U.S. EPA identified as having equivalent LDAR programs to the proposed 2018 NSPS amendments comprise only three of the top 10 crude oil producing States and four of the top 10 natural gas producing States.[64] Excluding Texas[65] reduces these numbers to only two and three of the top 10, respectively. This further demonstrates the inaccuracy of U.S. EPA's claim that the top oil and natural gas producing States' regulations would sufficiently compensate for a lack of federal regulation of existing sources.

Voluntary measures and programs are inadequate to address emissions from existing sources because they cannot be enforced, lack accountability, and depend on market

[60] 84 Fed. Reg. at 50,277.
[61] Equivalency of State Fugitive Emissions Programs for Well Sites and Compressor Stations to Proposed Standards at 40 CFR part 60, Subpart OOOOa, April 12, 2018, Docket ID No. EPA–HQ–OAR–2017–0483.
[62] In comments submitted to U.S. EPA on December 17, 2018 (Docket ID No. EPA-HQ-OAR-2017-0483-0785), CARB described issues with U.S. EPA's equivalency determination for Texas due to different leak definitions based on equipment types. *See* p. 17.
[63] 83 Fed. Reg. at 52,081.
[64] Based on 2017 production data from the U.S. Energy Information Administration (U.S. EIA).
[65] See footnote 62.

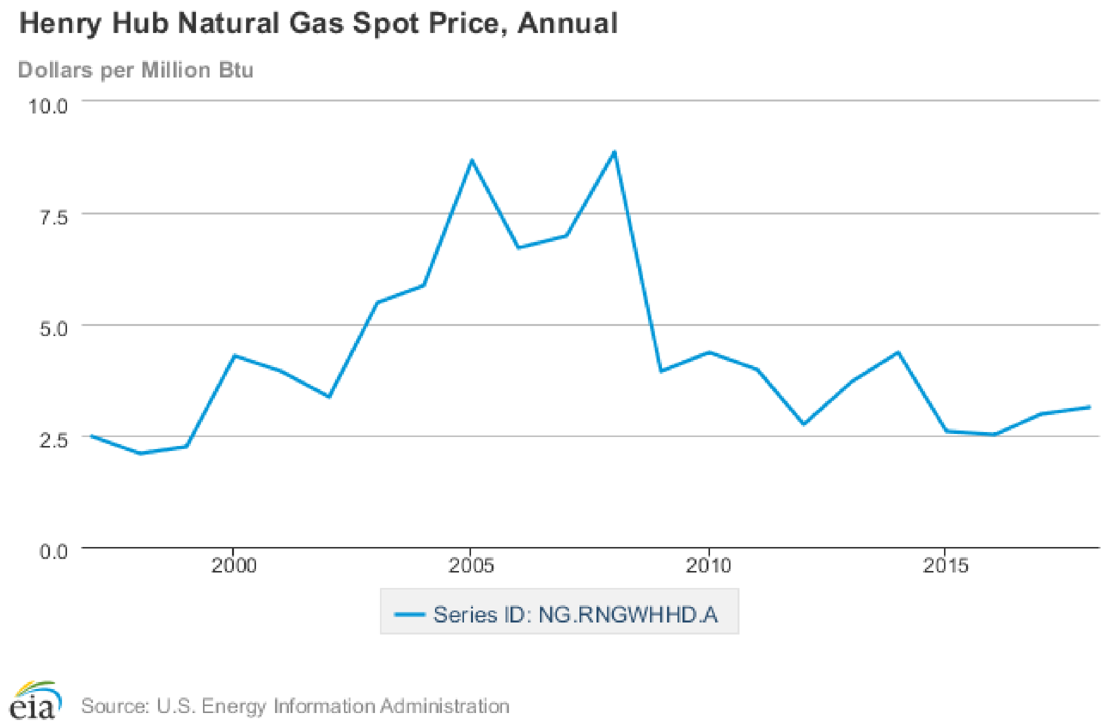
forces, business considerations, and/or corporate benevolence. Regulations are necessary to ensure that all existing sources reduce their emissions, not just select operators who opt into voluntary programs.

Market forces, U.S. EPA alleges, are adequate to control existing-source emissions, "assuming financially rational-acting producers."[66] The assumption that "financially rational-acting producers" will incorporate *privately* cost-effective production improvement is a prediction of producer theory with respect to a profit-maximizing firm. However, this assumption is not only unsupported but also contradicted. There are numerous complicating factors that will result in firms behaving differently than as simple theory might suggest, including financial constraints, principal-agent problems, uncertainty regarding future economic and financial conditions, and hyperbolic discounting of future returns. U.S. EPA acknowledges one confounding issue to this assumption: operators do not typically own the natural gas they transport, and only receive payment for their transportation service.[67] Given this fact, it is unlikely that an operator would find the emission controls *privately* "cost-effective," as they lack a mechanism to earn a return on their investment.

The assumption of rational actors is inconsistent with the rationale for numerous other federal rules that regulate fuel efficiency and energy efficiency standards. Although these regulations typically show substantial cost-savings to end-users, yielding positive returns over a lifecycle, it is still necessary for regulators to set requirements for these to ensure that businesses and individuals actually purchase pollution control or less-polluting equipment and that manufacturers produce it.

Additionally, historical evidence suggests that market incentives are not sufficient; natural gas prices were significantly higher over the past decade than they are currently (see chart below), giving business larger financial incentives to make such investments than exist currently, yet improved equipment still has not been widely adopted by the industry.

[66] 84 Fed. Reg. at 50,274.
[67] RIA at 2–15.



Finally, to illustrate the faultiness of the assumption that market forces will control emissions, one could simply pose the question: if these production improvements are so cost-effective for operators, why have they not already been widely adopted by industry?

IV. The economic analysis is biased, incomplete, and does not justify the Proposed Rule

U.S. EPA's Regulatory Impact Analysis (RIA) fails to demonstrate that the Proposal would provide overall benefits or improve the cost-effectiveness of the NSPS. This failure demonstrates that the Proposal does not, in fact, reflect the best system of emissions reduction because it shows that the Proposal would result in economically inefficient and environmentally damaging behavior.

The RIA uses multiple assumptions and methodologies to minimize quantification of climate harm, and omits quantification of many costs and associated harms of the proposed regulation, which result in an inaccurate and biased cost-benefit analysis. This analysis cannot support the Proposal.

A. Background on the social cost of methane

The social cost of methane (SC-CH_4) is the cost to society (in U.S. dollars) of adding 1-metric ton of CH_4 to the atmosphere in a particular year; it is intended to provide a measure of the damages from global climate change. Framed alternatively, it is the avoided cost (or benefit) of reducing CH_4 emissions by the same amount in a given year. The SC-CH_4 is a critically important metric to estimate accurately, because U.S. EPA justifies its Proposed Rule, in large part, as providing net cost-savings—a conclusion that U.S. EPA can only reach by manipulating the SC-CH_4 value it applies to the analysis. Additionally, without an accurate estimation of the SC-CH_4, U.S. EPA cannot provide the informed analysis required by law.

In 2008, the U.S. Ninth Circuit Court of Appeals set aside the National Highway Transportation Safety Administration's (NHTSA) 2006 Corporate Average Fuel Economy (CAFE) standard as arbitrary and capricious because it failed to monetize the benefits of GHG emission reductions.[68] There, the court characterized reductions in carbon emissions as "the most significant benefit of more stringent CAFE standards."[69] Subsequently, federal agencies have incorporated the social costs of GHGs, including carbon dioxide, methane, and nitrous oxide, into their analysis of regulatory actions in an effort to comprehensively account for the economic impact of regulations that impact GHG emissions.

Beginning in 2009, the President's Council of Economic Advisors and the U.S. Office of Management and Budget (OMB) convened the Interagency Working Group (IWG) on the Social Cost of GHGs (SC-GHGs) to develop a methodology for estimating the social cost of carbon (SC-CO_2) and other GHGs. This methodology relied on a standardized range of assumptions that could be used consistently when estimating the benefits of regulations across agencies. The IWG, comprised of scientific and economic experts, recommended the use of SC-CH_4 values based on three integrated assessment models (IAMs) developed over decades of global peer-reviewed research.[70] William Nordhaus, awarded the Sverigse Riksbank Prize in Economic Sciences in Memory of Alfred Nobel in 2018 and a member of the IWG,[71] defines IAMs as "approaches that integrate knowledge from two or more domains into a single framework."[72] IAMs used in the estimation of the SC-CH_4 combine models of the global economy and atmosphere to estimate geophysical and economic variables over

[68] *Center for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1203 (9th Cir. 2008).
[69] *Id.* at 1199.
[70] *See* IWG, Addendum to Technical Support Document on Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12866: Application of the Methodology to Estimate the Social Cost of Methane and the Social Cost of Nitrous Oxide, Aug. 2016 ("IWG Addendum"), *available at* https://www.epa.gov/sites/production/files/2016-12/documents/addendum_to_sc-ghg_tsd_august_2016.pdf.
[71] The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2018, https://www.nobelprize.org/prizes/economics/2018/summary/.
[72] William Nordhaus, Integrated economic and climate modeling, *Handbook of computable general equilibrium modeling*, ed. Peter Dixon and Dale Jorgenson, 2013, 1069–1131.

time.[73] Given the complexity of IAMs, the IWG provided guidance in transparency of methodology and assumptions as well as consistency across the input and models used to estimate the SC-CH_4, issued as TSDs.[74] These models and methodologies have been modified and updated since first being utilized, and represent the best available science in the field.

U.S. EPA is bound to use the best available science when setting standards and analyzing alternatives. It is further directed by E.O. 12866 (as modified by E.O. 13563) to conduct a cost-benefit analysis for all economically significant regulations that is based on the "best available science," use the "best available techniques" to quantify anticipated present and future benefits and costs, and use the best reasonably obtainable scientific, technical, and economic information.[75] OMB Circular A-4 further directs U.S. EPA actions in preparing regulatory analysis under E.O. 12866.[76] OMB Circular A-4 requires U.S. EPA to quantify anticipated benefits and costs of proposed rulemakings as accurately as possible using the best available techniques, and to ensure that any scientific and technological information or processes used to support their regulatory actions are objective.[77]

On March 28, 2017, the Presidential Executive Order on Promoting Energy Independence and Economic Growth, E.O. 13783, disbanded the IWG, withdrew the TSDs issued by the IWG, and instead directed all federal agencies to follow the guidance in OMB Circular A-4 when monetizing the value of changes in GHG emissions resulting from regulatory changes.[78] E.O. 13783 is internally contradictory: it withdrew the IWG's peer-reviewed TSDs as no longer representative of governmental policy, while directing agencies to base their regulatory analysis on the best available science and economics and OMB Circular A-4 (which it noted was "issued after peer review and public comment and has been widely accepted for more than a decade as embodying the best practices for conducting regulatory cost-benefit analysis.")[79]

The E.O.'s direction to disband the IWG and withdraw peer-reviewed and vetted scientific documents does not call into question the validity and scientific integrity of the IWG's SC-GHGs estimates, or the merit of independent scientific work in regulatory processes. This E.O. provided no rationale or defense of this withdrawal and offers no scientific or economic rationale for the changed SC-GHG valuations,

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[73] *See* IWG Addendum.
[74] *See* IWG Addendum.
[75] E.O. 12866, "Regulatory Planning and Review," Sept. 30, 1993; Executive Order 13563, "Improving Regulation and Regulatory Review," Jan. 18, 2011.
[76] OMB Circular A-4, Sept. 17, 2003, *available at* https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A4/a-4.pdf.
[77] OMB Circular A-4, Sept. 17, 2003, *available at* https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A4/a-4.pdf.
[78] 82 Fed. Reg. 16,093 (March 31, 2017).
[79] 82 Fed. Reg. 16,093 (March 31, 2017) at § 5(c), citing OMB Circular A-4.

which are counter to existing U.S. EPA Guidance and the consensus of experts.[80] E.O. 13783 requires agencies to follow contradictory statutory and executive mandates when monetizing the social cost of GHGs that simultaneously require using the best available science, while also purporting to prohibit the use of the best available science on the subject. The IWG's work remains relevant, reliable, and appropriate for use for these purposes. CARB supports continued use of the IWG SC-CH_4 values and strongly suggests that U.S. EPA support and promote the IWG SC-CH_4 values for transparency and consistency of regulatory analyses, including for the Proposed Rule.

B. Application of "interim domestic" social cost of methane is unjustified, inappropriate, and outcome-seeking

As noted above, the U.S. Ninth Circuit Court of Appeals set aside NHTSA's CAFE standard as arbitrary and capricious because it disregarded the benefits of GHG emission reductions.[81] The court held, "NHTSA . . . cannot put a thumb on the scale by undervaluing the benefits and overvaluing the costs of more stringent [CAFE] standards."[82] U.S. EPA's SC-CH_4 analysis, presented in the preamble and RIA for the Proposed Rule, is undermined similarly by several fatal flaws: utilization of an inappropriate and poorly modeled "interim domestic" social cost of methane, and presentation of only two inappropriate discount rates (which are inconsistently applied). These errors lead to social cost values that are a fraction of those used in hundreds of regulatory proceedings at the federal level. The "interim domestic" SC-CH_4 is in direct violation of U.S. EPA's statutory mandates, Executive Orders 12866, 13563, and 13783, and Circular A-4.

In the NSPS RIA, U.S. EPA quantified the benefits of the proposed rule using the IWG SC-CH_4. U.S. EPA's economic analysis showed that global climate benefits generally[83] outweigh the compliance costs, providing justification for the proposal based on this metric alone, though U.S. EPA identified other benefits.[84] The interim domestic SC-CH_4 used for the Proposed Rule, however, is between 6.6 and 8.2 times lower in value than the global SC-CH_4 for 2020 through 2025 based on U.S. EPA data for this

[80] *E.g.*, Drupp, Moritz, et al., Discounting Disentangled, *American Economic Journal: Economic Policy*, 10 (4): 109–34, 2018, *available at* https://www.aeaweb.org/articles?id=10.1257/pol.20160240&&from=f.
[81] *Center for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1203 (9th Cir. 2008).
[82] *Center for Biological Diversity*, 538 F.3d at 1203.
[83] Benefits outweigh compliance costs when a discount rate of 2.5% or 3% is used, but not when a discount rate of 5% is used.
[84] Regulatory Impact Analysis of the Final Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, May 2016, Docket ID No. EPA-HQ-OAR-2010-0505-7630, Table 1-2.

proposal.[85] This change is outcome-seeking; U.S. EPA is attempting to minimize quantification of the harms associated with the proposal.

C. The "interim domestic" SC-CH_4 violates directives requiring use of the best available science

The RIA for the Proposed Rule utilizes an "interim domestic" SC-CH_4 valuation that contradicts E.O. 13783's directive for estimates used in regulatory analyses to be "based on the best available science and economics."[86] The "interim domestic" SC-CH_4 also breaks with almost a decade of accepted peer-reviewed methodologies without rationale or justification and does not rely on the best available science and economics.

A domestic SC-CH_4 cannot follow the best available science because the existing IAMs used to estimate the SC-CH_4 are not calibrated for domestic-only valuations. In the 2010 TSD for the Social Cost of Carbon, the IWG states, "As an empirical matter, the development of a domestic SC-CO_2 is greatly complicated by the relatively few region- or country-specific estimates of the SC-CO_2 in the literature."[87] The IWG determined that a range of values from seven to twenty-three percent of the global social cost value might be used to adjust the global SC-CO_2 to calculate domestic effects.[88] However, the IWG cautions, "[T]hese values are approximate, provisional, and highly speculative. There is no a priori reason why domestic benefits should be a constant fraction of net global damages over time."[89]

In 2017, the National Academies of Sciences, Engineering, and Medicine released a report examining potential approaches for a comprehensive update to the social cost of carbon methodology to ensure resulting cost estimates reflect the best available science.[90] The report highlights the challenges in developing domestic SC-GHG estimates, given complex interactions related to migration, and economic and political destabilization.[91] Revising SC-GHG values to consider only domestic impacts without modifying the IAMs violates the expert recommendations of the National Academies:

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[85] Proposal RIA, Benefits and Tables OOOOa Reconsideration, Tab "SCCH$_4$," Docket ID No. EPA-HQ-OAR-2017-0483-0082, *available at* https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2017-0483-0082&attachmentNumber=1&contentType=excel12book.
[86] 82 Fed. Reg. 16,093 (March 31, 2017), § 5(c).
[87] Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866, Feb. 2010, *available at* https://www.epa.gov/sites/production/files/2016-12/documents/scc_tsd_2010.pdf.
[88] Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866, Feb. 2010, at 11.
[89] Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866, Feb. 2010, at 11.
[90] National Academies.
[91] National Academies.

"Estimation of the net damages per ton of [GHG] emissions to the United States alone, beyond the approximations done by the IWG, is feasible in principle; however it is limited by the existing SC-IAM methodologies, which focus primarily on global estimates and do not model all relevant interactions among regions."[92]

D. Use of a "domestic perspective" to calculate the SC-CH_4 is unjustified and inappropriate

The "interim domestic" SC-CH_4 is inconsistent with the OMB Circular A-4's guidance that analysis "should focus on benefits and costs that accrue to citizens and residents of the United States," and "where . . . a regulation that is likely to have effects beyond the borders of the United States, these effects should be reported separately."[93] GHGs create important impacts to the United States and U.S. citizens that do not stop at the U.S. border. These include impacts to U.S. citizens, including U.S. military service members, who live abroad and/or have significant investments abroad. The "interim domestic" SC-CH_4 also ignores impacts to national security through potential impacts to trade flows and global commodity markets. The Defense Authorization Act of 2018 acknowledges the global impacts of climate change, including some of the ways in which foreign impacts impose domestic costs, such as sea level rise that threatens U.S. military sites abroad and drought and famine that lead to failed states, "which are breeding grounds of extremist and terrorist organizations."[94] The National Academies agree:

> It is important to consider what constitutes a domestic impact in the case of a global pollutant that could have international implications that impact the United States. More thoroughly estimating a domestic SC-CO_2 would therefore need to consider the potential implications of climate impacts on, and actions by, other countries, which also have impacts on the United States.[95]

Because these impacts are not included in the domestic SC-CO_2 or SC-CH_4, these values likely underestimate the true cost to the United States.

If the global SC-CH_4 is applied, rather than the interim domestic SC-CH_4, the adverse climate impacts now more than offset any estimated compliance cost savings of the proposed rule, such that the benefits of the proposal no longer exceed the costs at

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[92] National Academies at 12.
[93] OMB Circular A-4, *but see California v. Bureau of Land Management,* 286 F.Supp.3d 1054, 1069-70 (N.D. Cal. 2018) (citing Circular A-4, along with Executive Order 13783, as a factual basis for the use of a domestic social cost of methane).
[94] Public Law 115-91, 131 Stat. 1283, § 335 (Dec. 12, 2017).
[95] National Academies, Conclusion 2-4. The social costs of methane have the same considerations as the social cost of carbon.

the 3% discount rate (Table 1).[96] Additionally, this along with proper quantification of other costs of the proposal (described in the next section) would result in an even worse benefit-cost ratio, indicating that this proposal is a bad decision in terms of economic efficiency.

Table 1: Comparison of benefits and costs for the proposal using the domestic versus global SC-CH_4[97] relative to the Current Regulatory Baseline

	7% discount rate		3% discount rate	
Analysis Item	**Domestic**	**Global**	**Domestic**	**Global**
Cost Savings to Industry	$97	$97	$123	$123
Costs—Forgone Climate Benefits[98]	$13	$96	$52	$402
Net Benefits—SC-CH_4	**$83**	**$1**	**$70**	**-$280**

**Values may not sum due to rounding.*

Further, the RIA acknowledges that the SC-CH_4 does not account for all potential harms and costs, including, for example, "direct health and welfare impacts associated with tropospheric ozone production by methane," and U.S. EPA does not account for them in any other way.[99] These health impacts could adversely affect individuals in the United States, resulting in multiple costs for hospitalizations and emergency room visits, which ultimately could impose new costs on individuals, private businesses who employee these workers, private insurance companies, and government agencies who provide health services. Excluding these costs results in an incomplete and biased cost-benefit analysis.

E. Considering discount rates of only 3 and 7 percent is inappropriate

The RIA for the Proposed Rule incorporates only two discount rates (3 and 7 percent), which it incorrectly asserts complies with OMB Circular A-4, and applies them inconsistently. Circular A-4 suggests that utilizing discount rates of 3 and 7 percent is likely appropriate, at minimum and in general. However, regarding costs and benefits that arise across generations—the type of intergenerational discounting at play in

[96] Based on emissions reported in the RIA for this proposal and the domestic and global SC-CH4 as included in U.S. EPA (2018). Benefits and Tables OOOOa Reconsideration. https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2017-0483-0082&attachmentNumber=1&contentType=excel12book.
[97] U.S. EPA (2018). Benefits and Tables OOOOa Reconsideration. Tab "Option 3" https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2017-0483-0082&attachmentNumber=1&contentType=excel12bookAt Tab "Option 3". All data taken directly from the 2018 RIA supporting data.
[98] This does not include potentially significant additional costs that were not quantified, as described below.
[99] RIA, p. 3.13.

analysis and consideration of climate impacts—Circular A-4 suggests that discount rates ranging from 1 to 3 percent are more appropriate.[100] U.S. EPA's choice to examine discount rates of only 3 and 7 percent is also contrary to IWG recommendations, which utilize 2.5, 3, and 5 percent discount rates.[101]

The SC-CH_4 is highly sensitive to discount rates. Higher discount rates decrease the value today of future environmental damages. The analysis should follow the IWG SC-CO_2 and present results for the three discount rates of 2.5, 3, and 5 percent to represent varying valuation of future damages. These rates are based on peer-reviewed expert input. The value today of environmental damages in the future is higher under the 2.5 discount rates compared to the 3 or 5 percent rates, reflecting the trade-off of consumption today and future damages. The IWG estimates and presents results for the SC-CO_2 across the 2.5, 3, and 5 percent discount rates that encompass a variety of assumptions regarding the correlation between climate damages and consumption of goods and are consistent with Circular A-4.

Further, the 3 and 7 percent estimates included in OMB Circular A-4 represent the before-tax rate of return to private capital and are not appropriate as the central estimates for an intergenerational valuation of the willingness-to-pay to avoid environmental damages, as the SC-CH_4 represents. The SC-CH_4 does not represent a 'private return to capital' and therefore the application of the 3 and 7 percent discount rates alone is inappropriate.

The 3 and 7 percent discount rates are also not in line with scientific or economic consensus. In a forthcoming peer-reviewed report, researchers surveyed 197 experts on the long-term social discount rates.[102] While there was much variation, the median preferred social discount rate is 2 percent, and 92 percent of experts surveyed preferred a social discount rate between 1 and 3 percent, lower than the lower of the two discount rates that U.S. EPA's analysis applies.[103]

In inaccurately purporting to follow the directive of Circular A-4 by applying the 3 and 7 percent discount rates, U.S. EPA's analysis does not even apply these two discount rates consistently. At least four tables provided in the proposal and RIA apply only the

[100] OMB Circular A-4.
[101] IWG Addendum. U.S. EPA acknowledges some of the arguments for applying a 2.5 percent discount rate in an appendix to the RIA, but does not include the 2.5 percent discount rate in its analysis. RIA, p. A-7.
[102] Drupp, Moritz, et al., Discounting Disentangled, *American Economic Journal: Economic Policy*, 10 (4): 109-34, 2018, *available at* https://www.aeaweb.org/articles?id=10.1257/pol.20160240&&from=f.
[103] Drupp, Moritz, et al., Discounting Disentangled, *American Economic Journal: Economic Policy*, 10 (4): 109-34, 2018, *available at* https://www.aeaweb.org/articles?id=10.1257/pol.20160240&&from=f.

7 percent discount rate and omit the 3 percent discount rate without explanation or justification.[104]

F. Potential updates to the best available science all point towards a higher, not lower, social cost of carbon

It is critical to update estimates of climate damages as the science and economic understanding of climate change and its impact improve over time. There is an active discussion within government and academia about the role of SC-GHGs in assessing regulations, quantifying avoided climate damages, and the values themselves.

Recent peer-reviewed research suggests that the IWG SC-GHG estimates on sector-specific impacts may be too low as economic and scientific modeling have progressed over time and new data has been incorporated into IAMs. A 2017 report published in *Nature Communications* presented new damage functions based on current scientific literature and estimate that the agricultural impacts as estimated in the IWG SC-CO_2 are too low.[105] The report finds that the impacts in the agricultural sector increase from a net benefit of $2.7 a tonne under the IWG SC-CO_2 to a net cost of $8.50 per tonne using the latest available science. This update alone of the agricultural impacts would cause the total IWG SC-CO_2 to more than double.

A 2018 working paper from the University of Chicago used subnational data from 41 countries to improve the estimation of mortality impacts due within the IWG SC-CO_2. The updated median willingness-to-pay to avoid excess mortality from warming could increase the IWG SC-CO_2 by up to $39 per tonne.[106] These recent findings point to the IWG SC-GHG estimates as too low and that an updated estimate based on peer-reviewed science would be higher than the IWG values.

V. U.S. EPA failed to quantify other costs of the Proposed Rule

Besides the adverse climate impacts described above, U.S. EPA fails to quantify multiple harms that represent significant costs to individuals, private businesses, and government agencies in the United States. By relaxing NSPS requirements, the Proposal would result in financial savings to industry at the expense of increased emissions of methane, VOCs, and hazardous air pollutants (HAP).[107] These emissions

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[104] 84 Fed. Reg. at 50,280–81, Tables 10 and 11; RIA, Tables 2-11 and 2-13.
[105] Moore, Frances, et al., New Science of Climate Change Impacts on Agriculture Implies Higher Social Cost of Carbon, *Nature Communications,* Volume 8, Article number 1607, 2017, *available at* https://www.nature.com/articles/s41467-017-01792-x.
[106] Carleton, Tamma, et al., Valuing the Global Mortality Consequences of Climate Change Accounting for Adaptation Costs and Benefits, August 2018, *available at* https://bfi.uchicago.edu/sites/default/files/file_uploads/WP_2018-51_0.pdf.
[107] RIA.

increases result in health, environmental, and welfare harms that represent new costs to individuals, businesses, and government agencies in the United States. The RIA for the Proposed Rule identifies and quantifies all financial benefits to the oil and natural gas industry, but does not quantify the harms associated with emissions increases. These costs, if quantified, could easily outweigh the benefits described in the Proposed Amendments RIA. Their exclusion creates a biased analysis.

In particular, the costs associated with adverse health and environmental outcomes due to increased emissions and exposures to VOCs, HAPs, particulate matter (PM), and ozone are omitted. The Proposed Rule, if finalized, would cause a significant increase in VOC emissions, which are a precursor to both ozone and secondary particulate matter. In addition, the proposal would increase emissions of HAPs. These emissions increases could adversely impact the health of individuals and increase occupational exposure for workers, likely resulting in significant costs. These costs may be borne in various ways throughout society including by individuals, private businesses, private health insurance, or public funding of health programs.

U.S. EPA's attempt to justify its failure to quantify non-climate impacts, by citing uncertainty about the location of future emission sources and the difficulty in modeling local air quality, is unpersuasive. Some amount of uncertainty in forward-looking analyses always exists. To be compliant with the laws, Executive Orders, and policies described above, however, RIAs must address that uncertainty through the various quantitative methods available, especially where it concerns increased costs and adverse impacts on public health. A health impact analysis for PM and ozone is longstanding practice at U.S. EPA, and the methods are well established. For example, another recent U.S. EPA RIA performed a similar analysis and found that rolling back existing regulatory protections would increase emissions that would cause thousands of premature deaths and other health impacts across the United States, resulting in billions of dollars of increased costs to individuals, businesses, and society.[108]

The costs associated with the health impacts caused by the Proposed Rule are likely significant. VOCs serve as precursors to the formation of fine particulate matter, particles small enough to penetrate the lungs. In addition to reducing visibility, fine particulate matter worsens acute and chronic respiratory ailments, including asthma.[109] Other health effects of these emissions include increased asthma emergency room

[108] Regulatory Impact Analysis for the Proposed Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units; Revisions to Emission Guideline Implementing Regulations; Revisions to New Source Review Program, Aug. 2018, Docket ID No. EPA-HQ-OAR-2017-0355-21182.
[109] U.S. Environmental Protection Agency (2009) Integrated Science Assessment for Particulate Matter Final Report http://www.epa.gov/ncea/pdfs/partmatt/Dec2009/PM_ISA_full.pdf.

visits, hospital admissions for cardiopulmonary causes,[110] and premature death in adults.[111, 112] VOCs and methane (the main component of natural gas) are also precursors to the formation of ground-level ozone (smog), which contributes to asthma and other respiratory problems, and particularly impacts children and outdoor workers.[113, 114] Typical valuations for morbidity and mortality used by U.S. EPA can be found in Table 5-9 of the RIA for the 2012 PM National Ambient Air Quality Standards (NAAQS) revisions.[115] For each mortality, U.S. EPA estimates the value of a statistical life to be $9.6 million dollars, and twelve other health outcomes valued by U.S. EPA vary from $68 to $200,000 per incidence.[116] Even minimal impacts on public health because of the proposal could easily offset any benefits to businesses, and an analysis of these impacts is necessary.

There are multiple metrics that U.S. EPA commonly uses to investigate the potential range of health impacts and the resulting costs from its proposed actions, and which U.S. EPA can and should use here. Circular A-4 describes multiple approaches to bound the potential impacts of a regulation where there is uncertainty in one or more outcomes.[117] U.S. EPA should apply these approaches to its current proposal to understand better the potential value of health impacts and the costs to individuals and society.

Additionally, U.S. EPA experts in the Office of Air Quality Planning and Standards published a paper on this very topic in July 2018.[118] U.S. EPA alleges that this study "does not yet supply the information needed to derive a VOC benefit per ton value suitable for a regulatory analysis."[119] However, the study, entitled "Assessing Human Health PM2.5 and Ozone Impacts from U.S. Oil and Natural Gas Sector Emissions in 2025," expressly quantifies the impacts of oil and natural gas emissions, applying a

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[110] Bell ML, Ebisu K, Peng R D, Samet J M, Zeger S L, Dominici F. 2008. Seasonal and regional short-term effects of fine particles on hospital admissions in 202 US Counties 1999-2005 Am J Epidemiol. 168(11): 1301–10.
[111] Brook, R.D. et al. (2010) "Particulate matter air pollution and cardiovascular disease-an update to the scientific statement from the American Heart Association" Circulation, 121:2331-2378.
[112] Krewski, D. et al. (2009) "Extended follow-up and spatial analysis of the American Cancer Society Study linking particulate air pollution and mortality" Health Effects Institute Research Report Number 140.
[113] U.S. Environmental Protection Agency (2006) Air Quality Criteria for Ozone and Related Photochemical Oxidants (Final Report) http://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=149923
[114] U. S. Environmental Protection Agency (2013) Integrated Science Assessment for Ozone and Related Photochemical Oxidants (Final Report) http://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=247492
[115] Regulatory Impact Analysis for the Final Revisions to the National Ambient Air Quality Standards for Particulate Matter, Dec. 2012 (Revised Feb. 28, 2013), Docket ID No. EPA-HQ-OAR-2007-0492-10094.
[116] Regulatory Impact Analysis for the Final Revisions to the National Ambient Air Quality Standards for Particulate Matter, Dec. 2012, at Table 5-9.
[117] *E.g.*, OMB Circular A-4, p. 38.
[118] Fann, Neal, et al., Assessing Human Health PM2.5 and Ozone Impacts from U.S. Oil and Natural Gas Sector Emissions in 2025, Environ. Sci. Technol. 2018, 52, 8095−8103, July 13, 2018.
[119] 84 Fed. Reg. at 50,279.

benefit-per-ton approach that is well established and has been widely used.[120] Rather than this approach, U.S. EPA writes, "to the extent that EPA were to quantify these ozone and PM impacts, it would estimate the number and value of avoided premature deaths and illnesses using an approach detailed in the Particulate Matter NAAQS and Ozone NAAQS Regulatory Impact Analyses."[121] Despite identifying a viable approach, U.S. EPA still declines to estimate the adverse impacts of its Proposed Rule, asserting simply, "[W]e are unable to quantify these effects at this time."[122] By refusing to estimate the costs of its Proposed Rule to human health, when the ability to estimate those costs has already been well demonstrated by its own experts, U.S. EPA refuses to consider an important aspect of the problem in violation of the CAA.

Similarly, RIA Table 3-1 attempts to rationalize U.S. EPA's failure to quantify any costs of its Proposed Rule besides the "interim domestic cost of methane."[123] For most of the adverse impacts that the agency failed to quantify, U.S. EPA blames "data limitations," despite acknowledging that it has quantified the same impacts in other analyses.[124] CARB disagrees that data limitations could prevent U.S. EPA from estimating the impacts of its Proposal, given that the RIA provides estimates of the anticipated emissions increases, and the methodology of U.S. EPA's own experts can readily be applied to these emissions to yield estimates for these endpoints.[125]

U.S. EPA not only fails to quantify the impacts of, but fails even to estimate and consider, methane's role as a precursor for ozone and its impact on achieving ozone NAAQS. Methane emissions contribute to global background ozone concentrations.[126] Mitigating methane emissions can reduce ozone concentrations globally. One study calculated that anthropogenic methane emissions contributed about 4 ppb to surface ozone globally in 2030 under the baseline growth scenario.[127] In nitrogen oxides saturated environment such as Southern California, the surface ozone sensitivity to methane emissions can be twice the global mean. Another study estimated that reducing 50% of anthropogenic methane emissions globally reduced summer afternoon surface ozone concentrations by three parts per billion (ppb) over the US (based on model year 1995) and nearly halves the incidence of US high ozone events

[120] Fann, Neal, et al., Assessing Human Health PM2.5 and Ozone Impacts from U.S. Oil and Natural Gas Sector Emissions in 2025, Environ. Sci. Technol. 2018, 52, 8095−8103, July 13, 2018.
[121] RIA, p. 3-2
[122] RIA, p. 3-2
[123] RIA, p. 3-3 et seq.
[124] RIA, p. 3-5.
[125] Fann, Neal, et al., Assessing Human Health PM2.5 and Ozone Impacts from U.S. Oil and Natural Gas Sector Emissions in 2025, Environ. Sci. Technol. 2018, 52, 8095−8103, July 13, 2018.
[126] West, J.J., Fiore, A.M., 2005, Management of tropospheric ozone by reducing methane emissions, Environmental Science & Technology, 39, 4685-4691.
[127] Fiore, A.M., West, J.J., Horowitz, L.W., Naik, V., Schwarzkopf, M.D. 2008, Characterizing the tropospheric ozone response to methane emission controls and the benefits to climate and air quality, Journal of Geophysical Research, 113, D08307, doi:10.1029/2007JD009162.

(i.e., defined as afternoon ozone concentrations greater than 70 ppb).[128] Another study estimated that reducing 20 percent of current global anthropogenic methane emissions will reduce ozone concentrations globally by 1 ppb.[129] Given the impact of methane emissions on global ozone concentrations, mitigating methane emissions can have significant global health benefits. For example, a study estimated that reducing 20 percent of current global anthropogenic methane emissions prevents 30,000 premature mortalities globally in 2030 and 370,000 cumulative mortalities between 2010 and 2030.[130] In 2017, Sarofim et al. estimated that 1 million metric ton decrease in methane emissions leads to 10–20 avoided mortality in the US and 200–300 avoided mortality globally on an annual basis.[131]

As global background ozone concentrations increase, meeting national ambient ozone standards becomes more difficult.[132] The public will benefit from more coordinated efforts globally on methane emission controls. Mitigating methane emissions can reduce ozone concentrations everywhere, which differs from other means of controlling emissions that have primarily local or regional impacts. US regulation on methane emissions will spur technological innovation and lead regulatory efforts in other countries. Global implementation of methane emission reductions will reduce global background ozone concentrations, achieve significant health benefits in the US and globally, and make it easier to achieve the national ambient ozone standards in the US.

Besides health impacts, there likely would be additional costs resulting from the Proposal that have not been quantified or monetized. These include adverse outcomes such as impacts to ecosystems, vegetation, and visibility.

The RIA for the Proposed Rule also does not quantify the governmental costs that result from the proposal. As a part of the Clean Air Act, the U.S. EPA sets NAAQS to protect public health. Many urban regions across the United States are in nonattainment for federal ozone and particulate matter NAAQS, meaning pollution levels are above limits the federal government deems safe, and states must implement

[128] Fiore, A.M., Jacob, D.J., Field, B.D., Streets, D.G., Fernandes, S.D., Jang, C., 2002, Linking ozone pollution and climate change: the case for controlling methane, Geophysical Research Letters, 29, 1919, doi:10.1029/2002GL015601.
[129] West, J.J., Fiore, A.M., Horowitz, L.W., Mauzerall, D.L., 2006, Global health benefits of mitigating ozone pollution with methane emission controls, Proceedings of the National Academy of Sciences of the United States of America, 103, 3988–93.
[130] West, J.J., Fiore, A.M., Horowitz, L.W., Mauzerall, D.L., 2006, Global health benefits of mitigating ozone pollution with methane emission controls, Proceedings of the National Academy of Sciences of the United States of America, 103, 3988–93.
[131] Sarofim, M.C., Waldhoff, S.T., Anenberg, S.C., 2017, Valuing the ozone-related health benefits of methane emission controls, Environmental Resource Economics, 66, 45-63.
[132] West, J.J., Fiore, A.M., Horowitz, L.W., Mauzerall, D.L., 2006, Global health benefits of mitigating ozone pollution with methane emission controls, Proceedings of the National Academy of Sciences of the United States of America, 103, 3988–93.

programs, incentives, or regulations to reduce emissions. An increase in VOC emissions can increase ozone and particulate matter concentrations, which may make it more difficult for states to meet the federal standards. This may result in the need for states to develop new programs to address these emissions impacts. This would create new costs to plan, promulgate, implement, and enforce additional regulations, programs, and/or incentives that were not included in the RIA.

A. U.S. EPA failed to model emissions increases

While U.S. EPA acknowledges that the emissions increases resulting from its proposal "may increase ozone formation, human exposure to ozone, and the incidence of ozone related health effects[,]" the agency declined to quantify related costs due to "complexity" and "uncertainty," and declined to perform air quality modeling that would quantify the ozone-related costs due to "data limitations."[133] Without such modeling, however, U.S. EPA claims, "we are unable to estimate the effect" of the proposal's VOC emissions impacts on ambient ozone concentrations.[134] The agency makes the same claims about its decision not to estimate or model visibility impacts.[135]

However, U.S. EPA conducts large-scale modeling studies for the continental U.S. on a regular basis, and these studies can be designed to provide the type of information needed to assess the impact of increases in VOC emissions on ozone (and $PM_{2.5}$) on a region-specific basis, while accounting for the complex non-linear chemistry of ozone formation. If U.S. EPA has resources to conduct multi-decadal coupled meteorology-air quality model simulations,[136] then they certainly have the resources needed to conduct a single model simulation with Direct Decoupled Method (DDM) analysis[137] to assess the ozone response to changes in VOC emissions. U.S. EPA does have the resources, expertise, and ability to conduct modeling to assess these impacts, but has chosen not to.

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133 RIA at p. 3-15.
134 RIA at p. 3-15.
135 RIA at p. 3-19.
136 E.g., Mathur, R., J. Xing. S. Napelenok, J. Pleim, C. Hogrefe, D. Wong, C.-M. Gan, and D. Kang (2016) Multiscale Modeling of Multi-decadal Trends in Ozone and Precursor Species Across the Northern Hemisphere and the United States. In: Steyn D., Chaumerliac N. (eds) Air Pollution Modeling and its Application XXIV. Springer Proceedings in Complexity. Springer, Cham.
137 E.g., Napelenok, S. L., K. M. Foley, D. Kang, R. Mathur, T. Pierce, and S. T. Rao (2011) Dynamic evaluation of regional air quality model's response to emission reductions in the presence of uncertain emission inventories, 45 (24), 4091–98. https://doi.org/10.1016/j.atmosenv.2011.03.030

B. The RIA fails to analyze impacts on "sub-populations of particular concern"

Circular A-4 states that RIAs should describe how "both benefits and costs are distributed among sub-populations of particular concern."[138] Without quantifying the adverse health and environmental impacts likely to result from the Proposed Rule, it is not possible to describe their distributional impacts. The Proposed Rule will likely impact a number of sub-populations of particular concern. Air pollution is known to affect disproportionally multiple groups including children, elderly, those with pre-existing cardiopulmonary diseases, and those with low socioeconomic standing.[139] As such, emissions increases may disproportionally harm these groups—but U.S. EPA failed to undertake this analysis.

1. Impacts on Children

E.O. 13045 and Circular A-4 require additional analyses in the case that a regulation could produce environmental health risks that disproportionately impact children.[140] E.O. 13045 requires Federal agencies to "make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children."[141] In addition, E.O. 13045 requires each regulatory action to evaluate the environmental health or safety effects on children, and explain why the proposal is preferable to other potentially effective and reasonably feasible alternatives.[142]

U.S. EPA claims that the proposed action is not subject to E.O. 13045 because the Proposed Rule is "not economically significant as defined in Executive Order 12866."[143] However, E.O. 13045 applies to proposed actions that are not economically significant but that would have adverse material effects on the environment, public health, or governments or communities.[144] U.S. EPA was therefore required to evaluate the potential impacts on children, and did not.

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[138] OMB Circular A-4.
[139] *E.g.*, U.S. EPA, Integrated Science Assessment for Particulate Matter, EPA/600/R-08/139F, 2009, *available at* https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=216546.
[140] OMB Circular A-4, p. 44; E.O. 13045, April 21, 1997.
[141] E.O. 13045, April 21, 1997.
[142] E.O. 13045, April 21, 1997.
[143] 84 Fed. Reg. at 50,282.
[144] E.O. 13045 applies to "any substantive action in a rulemaking . . . that is likely to result in a rule that may: (a) be 'economically significant' under Executive Order 12866 (a rulemaking that has an annual effect on the economy of $100 million or more <u>or</u> would adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, <u>the environment, public health</u> or safety, <u>or State, local, or tribal governments or communities</u>); and (b) concern an environmental health risk or safety risk that an agency has reason to believe may disproportionately affect children." E.O. 13045, April 21, 1997, sec. 2-202 (emphases added).

Additionally, U.S. EPA suggests that children will continue to be adequately protected by "applicable local, state, or federal permitting or air quality management programs that will continue to address areas with degraded air quality and maintain the air quality in areas meeting current standards,"[145] ignoring both the impact of increased VOC and methane emissions on areas in non-attainment with NAAQS and U.S. EPA's many concurrent efforts to undermine and avoid its other regulatory obligations.[146] The Proposed Rule have the potential to cause environmental harm that disproportionately impacts children, and U.S. EPA has not met its obligation to analyze these impacts.

2. Environmental Justice Impacts

E.O. 12898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, requires additional analyses in the case that a regulation could produce environmental health risks with environmental justice impacts.[147] E.O. 12898 requires agencies to evaluate proposed actions for "disproportionately high and adverse human health or environmental effects on minority populations, low-income populations and/or indigenous peoples."[148] Additionally, § 601 of Title VI of the Civil Rights Act of 1964 prohibits discrimination under covered programs and activities.[149]

U.S. EPA proffers its "belief," but no evidence, that the Proposal is unlikely to impose disproportionate risk on minority populations, low-income populations, and/or indigenous peoples.[150]

Additionally, U.S. EPA claims that these populations will continue to be adequately protected by "existing NAAQS and other mechanisms in the CAA,"[151] ignoring both the impact of increased methane and VOC emissions on areas in non-attainment with NAAQS and U.S. EPA's many concurrent efforts to undermine and avoid its other

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[145] 84 Fed. Reg. at 50,282.
[146] *E.g.*, "Proposed Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks," 83 Fed. Reg. 42,986 (Aug. 24, 2018); "Call for Information on Adverse Effects of Strategies for Attainment and Maintenance of National Ambient Air Quality Standards," 83 Fed. Reg. 29,784 (June 26, 2018); Guidance Memorandum, "Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act," 83 Fed. Reg. 5,543 (Feb. 8, 2018); "Proposed Repeal of Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 82 Fed. Reg. 48,035 (Oct. 16, 2017).
[147] E.O. 12898, Feb. 11, 1994.
[148] E.O. 12898, Feb. 11, 1994.
[149] *But see Alexander v. Sandoval*, 532 U.S. 275 (2001) (private right of action to enforce § 601 is limited to intentional discrimination).
[150] 84 Fed. Reg. at 50283.
[151] 84 Fed. Reg. at 50283.

regulatory obligations.[152] The Proposed Rule has the potential to cause environmental harm that disproportionately impacts environmental justice communities, and U.S. EPA must perform an analysis of these impacts.

C. Time Horizon

The time horizon for the economic analysis is a mere 6 years (2019-2025).[153] This may not fully capture the harms of the proposed regulation, which increase over time. The RIA for the proposed amendments shows that emissions of methane, VOCs, and HAPs increase linearly over the analysis period,[154] and this presumably would continue into future years (increasing the overall costs of the amendments).

The RIA for the Proposed Rule states that while "it is desirable to analyze impacts beyond 2025," uncertainty precludes this analysis.[155] This argument is not compelling, as a sensitivity of potential impacts could be bounded using various assumptions. Uncertainty in future impacts is routinely projected using likely low to high range, or likely scenarios, of input variables. A well-known example of this approach is used in projecting future global temperature change in Intergovernmental Panel on Climate Change reports.[156]

Additionally, U.S. EPA begins its cost analysis in 2019, although the comment deadline on the Proposed Rule is not until November 25, 2019, and the proposal is unlikely to be finalized for at least several months thereafter. Given the short six-year regulatory horizon considered in the RIA, using an inaccurate timeline further diminishes the information provided to the public regarding future impacts of the Proposal. This may also distort the analysis from a cost-benefit analysis perspective, to the extent that the relative magnitudes of cost and benefits vary over time.

D. Labor Impacts

Rather than providing an informative analysis of potential labor and employment impacts as part of its RIA, U.S. EPA asserts that vaguely defined uncertainties prevent

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[152] *E.g.*, "Proposed Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks," 83 Fed. Reg. 42,986 (Aug. 24, 2018); "Call for Information on Adverse Effects of Strategies for Attainment and Maintenance of National Ambient Air Quality Standards," 83 Fed. Reg. 29,784 (June 26, 2018); Guidance Memorandum, "Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act," 83 Fed. Reg. 5,543 (Feb. 8, 2018); "Proposed Repeal of Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 82 Fed. Reg. 48,035 (Oct. 16, 2017).
[153] RIA at 2-21.
[154] RIA at Table 2-3.
[155] RIA at 5-12.
[156] *E.g.*, IPCC, Special Report on Global Warming of 1.5°C, 2018, figure SPM.1(a), *available at* https://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf.

any quantitative assessment of the employment impacts. An appropriate RIA must address that uncertainty through the various quantitative methods available, especially where it concerns potential employment impacts.

The RIA for the OOOOa NSPS included a quantitative partial employment analysis , finding that the one-time labor requirement for the affected sector to be about 270 full-time equivalents (FTE) in 2020 and 2025, and the annual labor requirement was estimated to be about 1,100 FTEs in 2020 and 1,800 FTEs in 2025.[157] One approach EPA could have used is to compare the Proposed Rule to the 2016 NSPS OOOOa and made a quantitative estimate of how these estimated FTEs may change as a result of this proposal.

VI. The Proposed Rule violates Clean Air Act section 307(d)

Clean Air Act section 307(d) lays out procedural requirements for most rulemaking under the Act, including New Source Performance Standards.[158] It requires that a Notice of Proposed Rulemaking be "accompanied by a statement of its basis and purpose."[159] This must include:

> [A] summary of (A) the factual data on which the proposed rule is based; (B) the methodology used in obtaining the data and in analyzing the data; and (C) the major legal interpretations and policy considerations underlying the proposed rule . . . . All data, information, and documents referred to in this paragraph on which the proposed rule relies shall be included in the docket on the date of publication of the proposed rule.[160]

The Notice of Proposed Rulemaking fails to meet these standards in several respects. U.S. EPA solicits data that *would* support amendments, presently unjustified, that the agency is already proposing[161]; and rejects its own data, analyses, and duly-promulgated NSPS because of vague "uncertainties".[162] Additionally, as noted above, U.S. EPA possesses an immense amount of directly-relevant data provided by the regulated facilities themselves, as a consequence of the NSPS and related ICR.[163] Strikingly, U.S. EPA scarcely references any of this compliance data, and does not place any of the reports in the docket.

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[157] RIA at p. 4-6.
[158] 42 U.S.C. § 7607(d)(1)(A)(C).
[159] 42 U.S.C. § 7607(d)(3).
[160] 42 U.S.C. § 7607(d)(3).
[161] *E.g.*, 84 Fed. Reg. at 50,273–74.
[162] *E.g.*, 84 Fed. Reg. at 50,273–74.
[163] 81 Fed. Reg. 35,824 (June 3, 2016); U.S. EPA ICR 2523.01c, RIN 2060-AS30, *available at* https://www.reginfo.gov/public/do/PRAViewDocument?ref_nbr=201807-2060-002.

The Regulatory Impact Analysis (RIA) for the Proposed Rule repeatedly violates the additional requirement of Clean Air Act section 307(d) that the statement of basis and purpose "set forth or summarize and provide a reference to any pertinent findings, recommendations, and comments by . . . the National Academy of Sciences, and, if the proposal differs in any important respect from any of these recommendations, an explanation of the reasons for such differences."[164] In 2017, the National Academies of Sciences, Engineering, and Medicine released a report examining potential approaches for a comprehensive update to the methodology for estimating the social cost of GHGs to ensure resulting cost estimates reflect the best available science.[165] The report makes several "pertinent findings, recommendations, and comments" with which the RIA for the Proposed Rule fails to engage.

As discussed above, the Proposed Rule relies on U.S. EPA's outcome-seeking application of an "interim domestic" social cost of methane (SC-CH_4), rather than the global value traditionally employed, to minimize the monetized costs of the increased methane emissions that would result from the Proposal. The National Academies report notes that domestic-only values for the social costs of GHGs have not been adequately researched and are not yet appropriate for application: "Estimation of the net damages per ton of [GHG] emissions to the United States alone, beyond the approximations done by the [Interagency Working Group], is feasible in principle; however it is limited by the existing [Social Cost-Integrated Assessment Model] methodologies, which focus primarily on global estimates and do not model all relevant interactions among regions."[166] U.S. EPA merely acknowledges the National Academies' caveat,[167] which does not meet the statutory requirement to, "if the proposal differs in any important respect from any of these recommendations, [provide] an explanation of the reasons for such differences."[168]

VII. U.S. EPA cannot require pollutant-specific significant contribution findings for an already listed source category

U.S. EPA should not upend its long-standing, well-reasoned interpretation to require pollutant-specific significant contribution findings for additional pollutants from a source category. Section 111(b) of the Clean Air Act is clear and unambiguous: U.S. EPA must include a category of stationary sources if that *source* "causes, or contributes significantly to, air pollution."[169] Nothing in that requirement suggests that

[164] 42 U.S.C. § 7607(d)(3).
[165] National Academies of Science, Engineering, and Medicine, Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide, 2017, *available at* http://www.nap.edu/24651 ("National Academies").
[166] National Academies at 12.
[167] RIA at 3-14.
[168] 42 U.S.C. § 7607(d)(3).
[169] 42 U.S.C. § 7411(b)(1)(A).

a source could be in the list with respect to some pollutants, but not in the list with respect to other pollutants—indeed, section 111 contemplates a single "list" of categories of stationary sources.[170]

Once a category of stationary sources is added to the section 111 list, U.S. EPA must promulgate regulations establishing standards of performance for new (section 111(b)) and existing (section 111(d)) sources. Section 111 defines "standard of performance"[171] and in doing so, does not permit U.S. EPA to make any sort of "pollutant-specific significant contribution finding" nor exclude sources with respect to pollutants based on any such finding. Once a category of sources is identified, U.S. EPA has the power and obligation to regulate all air emissions from those sources, within the limitations set forth in section 111 for standards of performance and the need to demonstrate a rational basis for those regulations. This power and obligation extends to pollutants only later discovered to be problematic. And despite U.S. EPA's implication in its Proposed Rule that it was unaware of the harm of greenhouse gases in the 1970s (when it first listed the source categories at issue here), by the 1970s the potential harm of greenhouse gases was well known to the scientific community.[172]

Furthermore, U.S. EPA is well aware of this distinction between listing a category and imposing standards of performance for sources that fall within already listed categories. Indeed, U.S. EPA practice is typically to list source categories without first making specific "contribute significantly" findings for specific pollutants.[173] It is disingenuous for U.S. EPA to claim ignorance of this history by pointing to a 1977 guideline document that did not undergo the thorough public scrutiny required for regulations.[174] Nor is it convincing when U.S. EPA quotes a House Conference Committee Report summarizing the 1977 Clean Air Act amendments: "In all future rulemaking in these areas, the Administrator could regulate any air pollutant from those sources, the emissions of which 'in his judgment cause or contribute to air pollution . . . .'"[175] Beside the fact that a single legislative report cannot overcome the plain meaning of the statute, U.S. EPA ignores the plain meaning of the quote in question. The phrase "the emissions of which" modifies the word "sources," not "air pollutant," and so the quotation at issue is properly read to mean: "the Administrator could regulate any air pollutant from those sources, the emissions of a source that 'in his judgment cause or contribute to air pollution . . . .'" In other words, this Committee

[170] 42 U.S.C. § 7411(b).
[171] 42 U.S.C. § 7411(a)(1).
[172] *See, e.g.*, Danny Lewis, *Scientists have been talking about greenhouse gases for 191 years*, SMITHSONIAN.COM (Aug. 3, 2015), available at https://www.smithsonianmag.com/smart-news/scientists-talking-about-greenhouse-gases-191-years-180956146/.
[173] *See* List of Categories of Stationary Sources, 36 Fed. Reg. 5,931 (Mar. 31, 1971); Priority List and Additions to the List of Categories of Stationary Sources, 44 Fed. Reg. 49,222 (Aug. 21, 1979).
[174] Proposed Rule at 50,266.
[175] Proposed Rule at 50,264 (quoting H.R. Rep. No. 95-564, at 183–84 (1977)).

Report is at best ambiguous as to whether the source or the air pollutant must be the focus of the "cause or contribute" finding.

VIII. U.S. EPA should maintain its reporting requirements and ICR

The NSPS and co-promulgated Information Collection Request (ICR) require sources to submit annual compliance reports to U.S. EPA, including reporting about regulated entities' compliance with the NSPS leak detection and repair requirements.[176] U.S. EPA assumes that omitting transmission and storage sources from the source category would rescind the reporting requirements and ICR, and does not provide justification for these proposed amendments. However, Clean Air Act section 114(a)(iii) authorizes reporting, monitoring, recordkeeping, and related requirements on any source or operator, that would help carry out any other non-vehicular provision of the Clean Air Act, regardless of whether those sources are listed under section 111.[177] Even if U.S. EPA finalizes its proposed removal of transmission and storage sources from the source category, it need not, and should not, repeal the reporting and recordkeeping requirements and ICR, which provide value to U.S. EPA, State, local, and Tribal regulators, and the public. Further, because removal of transmission and storage sources from the source category would not compel U.S. EPA to repeal the reporting and recordkeeping requirements and ICR for these sources, U.S. EPA must justify its proposal of these amendments, which it has failed to do.

Conclusion

CARB reiterates its support of U.S. EPA's 2016 Oil and Gas New Source Performance Standards for New, Reconstructed, and Modified Sources, and cautions U.S. EPA that its proposal to rescind this standard is illegal, inappropriate, and contrary to its Clean Air Act obligations to protect public health and welfare.

Sincerely,

Richard W. Corey
Executive Officer

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[176] 81 Fed. Reg. 35,824 (June 3, 2016); U.S. EPA ICR No. 2523.01c, RIN 2060-AS30, *available at* https://www.reginfo.gov/public/do/PRAViewDocument?ref_nbr=201807-2060-002.
[177] 42 U.S.C. § 7414(a)(iii).

UNITED STATES DISTRICT COURT
DISTRICT OF COLUMBIA
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STATE OF NEW YORK, STATE OF CALIFORNIA, STATE OF CONNECTICUT, STATE OF ILLINOIS, STATE OF IOWA, STATE OF MAINE, STATE OF MARYLAND, COMMONWEALTH OF MASSACHUSETTS, STATE OF NEW MEXICO, STATE OF OREGON, COMMONWEALTH OF PENNSYLVANIA, STATE OF RHODE ISLAND, STATE OF VERMONT, STATE OF WASHINGTON, DISTRICT OF COLUMBIA, CITY OF CHICAGO

Plaintiffs,

– against –

E. SCOTT PRUITT, in his official capacity as Administrator of the United States Environmental Protection Agency, and the UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,

Defendants.
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COMPLAINT

Index No. 1:18-cv-773

The States of New York, California, Connecticut, Illinois, Iowa, Maine, Maryland, New Mexico, Oregon, Rhode Island, Vermont, Washington, the Commonwealths of Massachusetts and Pennsylvania, the District of Columbia, and the City of Chicago (collectively "Plaintiffs" or "States and Local Governments") bring this action to compel E. Scott Pruitt, in his official capacity as Administrator of the United States Environmental Protection Agency, and the United States Environmental Protection Agency (together, "EPA"), to comply with the nondiscretionary duty under the Clean Air Act ("Act") to establish guidelines for limiting methane emissions from existing sources in the oil and natural gas sector, thereby remedying EPA's unreasonable delay in establishing such emission guidelines.

JURISDICTION AND VENUE

1. This Court has jurisdiction over this action pursuant to section 304(a) of the Act, 42 U.S.C. § 7604(a), which authorizes any person, after duly giving notice, to commence an

action in district court to compel agency action unreasonably delayed. The Court also has jurisdiction to hear this civil action pursuant to 28 U.S.C. § 1331 (federal question jurisdiction) and 28 U.S.C. § 1361 (action to compel officer or agency to perform a duty owed to plaintiffs).

2. Venue in this Court is proper pursuant to 28 U.S.C. § 1391(e), because this civil action is brought against an agency of the United States and an officer of the United States, acting in his official capacity, and a substantial part of the events or omissions giving rise to Plaintiffs' claim occurred in this judicial district, as the Administrator's failure to perform his nondiscretionary duty to establish guidelines for limiting methane emissions from existing sources in the oil and natural gas sector occurred in this district, and EPA maintains an office in this district.

3. Since the action unreasonably delayed would be reviewable in the United States Court of Appeals for the District of Columbia Circuit under section 307(b) of the Act, 42 U.S.C. § 7607(b), venue is also proper in this Court under section 304(a) of the Act, 42 U.S.C. § 7604(a) ("[A]n action to compel agency action referred to in section 7607(b) of this title which is unreasonably delayed may only be filed in a United States District Court within the circuit in which such action would be reviewable under section 7607(b) of this title.").

NOTICE

4. On June 29, 2017, Plaintiffs sent EPA notices of intent to sue for EPA's failure to establish guidelines for standards of performance for methane emissions from existing oil and natural gas sources. The letters provided 180-day notice for an action to compel agency action unreasonably delayed under section 304(a).

5. More than 180 days have passed since the Plaintiffs sent the notice letters, and EPA still has not completed its mandatory obligation to issue guidelines for the control of

methane emissions from existing oil and natural gas sources to remedy its unreasonable delay in issuing such guidelines.

PARTIES

6. Plaintiff State of New York is a sovereign entity that brings this action on its own behalf to protect state property and on behalf of its citizens and residents to protect their health and well-being and to protect natural resources held in trust by the State.

7. Plaintiff State of California is a sovereign entity that brings this action on its own behalf to protect state property and on behalf of its citizens and residents to protect their health and well-being and to protect natural resources held in trust by the State.

8. Plaintiff State of Connecticut is a sovereign entity that brings this action on its own behalf to protect state property and on behalf of its citizens and residents to protect their health and well-being and to protect natural resources held in trust by the State.

9. Plaintiff State of Illinois is a sovereign entity that brings this action on its own behalf to protect state property and on behalf of its citizens and residents to protect their health and well-being and to protect natural resources held in trust by the State.

10. Plaintiff State of Iowa is a sovereign entity that brings this action on its own behalf to protect state property and on behalf of its citizens and residents to protect their health and well-being and to protect natural resources held in trust by the State.

11. Plaintiff State of Maine is a sovereign entity that brings this action on its own behalf to protect state property and on behalf of its citizens and residents to protect their health and well-being and to protect natural resources held in trust by the State.

12. Plaintiff State of Maryland is a sovereign entity that brings this action on its own behalf to protect state property and on behalf of its citizens and residents to protect their health and well-being and to protect natural resources held in trust by the State.

13. Plaintiff Commonwealth of Massachusetts is a sovereign entity that brings this action on its own behalf to protect state property and on behalf of its citizens and residents to protect their health and well-being and to protect natural resources held in trust by the State.

14. Plaintiff State of New Mexico is a sovereign entity that brings this action on its own behalf to protect state property and on behalf of its citizens and residents to protect their health and well-being and to protect natural resources held in trust by the State.

15. Plaintiff State of Oregon is a sovereign entity that brings this action on its own behalf to protect state property and on behalf of its citizens and residents to protect their health and well-being and to protect natural resources held in trust by the State.

16. Plaintiff Commonwealth of Pennsylvania is a sovereign entity that brings this action on its own behalf to protect state property and on behalf of its citizens and residents to protect their health and well-being and to protect natural resources held in trust by the State.

17. Plaintiff State of Rhode Island is a sovereign entity that brings this action on its own behalf to protect state property and on behalf of its citizens and residents to protect their health and well-being and to protect natural resources held in trust by the State.

18. Plaintiff State of Vermont is a sovereign entity that brings this action on its own behalf to protect state property and on behalf of its citizens and residents to protect their health and well-being and to protect natural resources held in trust by the State.

19. Plaintiff State of Washington is a sovereign entity that brings this action on its own behalf to protect state property and on behalf of its citizens and residents to protect their health and well-being and to protect natural resources held in trust by the State.

20. Plaintiff District of Columbia is a municipal entity that brings this action on its own behalf to protect city property and on behalf of its residents to protect their health and well-being.

21. Plaintiff City of Chicago is a municipal entity that brings this action on its own behalf to protect city property and on behalf of its residents to protect their health and well-being.

22. Each of the plaintiffs is a "person" as defined in the applicable provision of the Act, 42 U.S.C. § 7602(e).

23. Defendant E. Scott Pruitt is Administrator of the EPA. The Administrator is charged with implementing and enforcing the Act, including the nondiscretionary requirement in section 111(d), 42 U.S.C. § 7411(d), to establish guidelines for limiting emissions of any non-criteria and non-hazardous air pollutants from existing sources in a source category when EPA establishes standards of performance for emissions of air pollutants from new sources in the source category under section 111(b).

24. Defendant EPA is an executive agency of the federal government charged with implementing and enforcing the Act in coordination with the states.

STATUTORY AND REGULATORY FRAMEWORK

25. Section 111 of the Act requires EPA to develop air pollution control performance standards that apply to specific categories of stationary sources. Section 111(b) requires the Administrator to list categories of stationary sources that the Administrator finds "cause[], or

contribute[] significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare." 42 U.S.C. § 7411(b)(1)(A). The Administrator then must establish "standards of performance" for emissions of air pollutants from new and modified sources within each such category ("new source performance standards" or "NSPS"). *Id.* § 7411(b)(1)(B).

26. Pursuant to section 111(b)(1)(B) of the Act, EPA must, "at least every eight years, review and, if appropriate, revise such standards" following the procedure required for promulgation of such standards. *Id.* § 7411(b)(1)(B).

27. When EPA establishes performance standards for new sources in a particular source category, EPA is also required under section 111(d) and applicable regulations to publish guidelines for controlling emissions from existing sources in that source category, subject to two narrow exceptions not applicable here. EPA's regulations provide that such guidelines will be issued "[c]oncurrently upon or after proposal of [section 111(b)] standards of performance for the control of a designated pollutant from affected facilities." 40 C.F.R. § 60.22(a).

28. After EPA issues final guidelines for existing sources for a designated pollutant, states have nine months to develop and submit state plans containing emission standards for control of that pollutant from designated facilities within the state. 40 C.F.R. § 60.23(a)(1). EPA must then take final action on the state plans within four months of the due date for those plans. *Id.* § 60.27(b). If EPA disapproves a state plan (or a portion thereof), it must promulgate a plan for the state within six months after the date required for submission of the plan. *Id.* § 60.27(d).

FACTUAL BACKGROUND

A. Methane Pollution

29. Methane is a potent greenhouse gas—pound for pound, it warms the climate twenty-eight to thirty-six times more over a one hundred-year time frame than carbon dioxide. According to the Intergovernmental Panel on Climate Change ("IPCC") 5th Assessment Report (2013), methane is the second leading climate-forcing agent after carbon dioxide globally. The IPCC has also found that, on a twenty-year timeframe, methane is about eighty-six times more potent than carbon dioxide.

30. In December 2009, EPA determined that methane, along with other greenhouse gases, endangers public health and welfare because of its contribution to climate change. 74 Fed. Reg. 66,496 (Dec. 15, 2009).

31. EPA has found that methane "contributes to warming of the atmosphere, which, over time, leads to increased air and ocean temperatures, changes in precipitation patterns, melting and thawing of global glaciers and ice, increasingly severe weather events, such as hurricanes of greater intensity and sea level rise." 77 Fed. Reg. 49,490, 49,535 (Aug. 23, 2011).

32. According to EPA's 2015 "Inventory of U.S. Greenhouse Gas Emissions and Sinks," total methane emissions from the oil and gas industry account for about 31 percent of the total methane emissions from all U.S. sources and account for about 10 percent of all U.S. greenhouse gas emissions from human activities, with oil and natural gas systems being the single largest source of methane emissions in the U.S..

33. Methane emissions from oil and natural gas sources harm plaintiffs and their citizens by significantly contributing to air pollution that causes climate change.

34. Plaintiffs and their citizens have experienced and will continue to experience injuries from climate change, including, but not limited to:

a. increased heat deaths and illnesses due to intensified and prolonged heat waves;

b. increased ground-level ozone pollution, with concomitant increases in asthma, bronchitis, heart disease, and emphysema, as well as coughing, throat irritation, and lung tissue damage;

c. beach erosion, temporary and permanent inundation of portions of coastal state property, damage to publicly owned coastal facilities and infrastructure, and salinization of water supplies from accelerated sea level rise;

d. more frequent flooding from more severe rains and higher storm surges resulting in property damage and hazard to human safety;

e. diminished water supplies and adverse impacts to agriculture due to reduced snowpack and more frequent and severe droughts;

f. deaths, property damage, and impairment of air and water quality from increasingly more severe and damaging wildfires;

g. additional state emergency response costs caused by more frequent and intense storm surges, floods, and wildfires; and

h. widespread loss of species and biodiversity, including the disappearance of hardwood forests from the northern United States.

35. The need for EPA to proceed promptly with the regulation of existing sources is especially pressing because the lion's share of methane emissions from the oil and natural gas

sector comes from existing sources. Indeed, sources in existence prior to 2012 are projected to be responsible for up to 90 percent of the methane emissions in the oil and natural gas sector in 2018. ICF Int'l, Economic Analysis of Methane Emission Reduction Opportunities in the U.S. Onshore Oil and Natural Gas Industries 1 (2014) (*available at* http://www.edf.org/sites/default/files/methane_cost_curve_report.pdf).

36. The same study found that industry could cut emissions forty percent below the projected 2018 levels at an average annual cost of less than one cent per thousand cubic feet of natural gas produced. Taking into account the total economic value of the natural gas that would be recovered through the use of these additional emissions controls, this forty percent reduction would yield savings of over $100 million dollars per year for the U.S. economy and consumers.

B. <u>EPA's Failure to Timely Issue Emissions Guidelines for Methane Pollution from Existing Oil and Natural Gas Operations</u>

37. The oil and natural gas sector is listed as a category of stationary sources that the Administrator has found causes or contributes significantly to air pollution that may reasonably be anticipated to endanger public health or welfare. 44 Fed. Reg. 49,222 (Aug. 21, 1979).

38. EPA originally promulgated standards of performance for sources in the oil and natural gas sector in 1985. 50 Fed. Reg. 26,122 (June 24, 1985); 50 Fed. Reg. 40,158 (Oct. 1, 1985).

39. EPA's failure to timely review the 1985 standards for sources in the oil and natural gas sector led multiple groups to file suit in 2009 to compel such review. That case, *Wild Earth Guardians v. EPA*, No. 1:09-CV-00089 (D.D.C.), resulted in the Court's entering a consent decree setting forth a schedule for EPA to propose and finalize any revisions to the oil

and gas sector standards of performance. The consent decree, as modified, required EPA to propose standards by July 28, 2011, and to take final action by April 17, 2012.

40. In August 2011, EPA proposed revisions to the oil and natural gas standards of performance. 76 Fed. Reg. 52,738 (Aug. 23, 2011). EPA acknowledged in the proposal that "processes in the Oil and Natural Gas source category emit significant amounts of methane," and that such emissions are equivalent to more than 328 million metric tons of carbon dioxide each year. *Id.* at 52,756. However, EPA did not propose any standards for methane emissions, despite having previously determined in 2009 that methane and other greenhouse gases endanger public health and welfare.

41. EPA signed a final rule revising some aspects of the oil and natural gas standards in April 2012, which was published on August 16, 2012 ("2012 Final Rule"). 77 Fed. Reg. 49,490.

42. In violation of its mandatory 8-year review obligation under section 111(b)(1)(B) of the Act, EPA failed to determine in the 2012 Final Rule whether it was appropriate to establish methane standards. Instead, EPA stated that "[i]n this rule, we are not taking final action with respect to regulation of methane. Rather, we intend to continue to evaluate the appropriateness of regulating methane with an eye toward taking additional steps if appropriate." *Id.* at 49,513. The agency stated that "over time," it would assess emissions data received pursuant to the recently implemented greenhouse gas emissions reporting program, which would help it evaluate whether to directly regulate methane and identify cost-effective ways to do so. *Id.* EPA set forth no timetable for taking final action to address methane emissions.

43. EPA stated that the standards it adopted in the 2012 Final Rule for emissions of volatile organic compounds ("VOCs") and hazardous air pollutants would have the incidental benefit of also reducing annual methane emissions by about 19 million metric tons of carbon dioxide equivalent, *id.* at 49,535, which is only a small fraction of the 328 million metric tons of total carbon dioxide equivalent methane emissions from the oil and natural gas sector.

44. Throughout this time, EPA had compelling data demonstrating that many measures to avoid (or reduce) methane leaks from new and existing oil and natural gas operations are available and cost-effective. For instance, through EPA's voluntary Natural Gas Star Program—a public-private partnership with the oil and natural gas industry launched in 1993—"many of [the] technologies and management practices" available to control methane emissions from the sector "have been well documented (including information on cost, benefits and reduction potential) and implemented in oil and gas systems throughout the U.S." EPA, Office of Air & Radiation, *Technical Support Document for the Advanced Notice of Proposed Rulemaking for Greenhouse Gases; Stationary Sources*, Sec. VII, at 30 (June 2008).

45. On December 11, 2012, several of the Plaintiff States notified EPA of their intent to sue the agency for violating the Clean Air Act by failing to determine in the 2012 rulemaking whether standards limiting methane emissions from oil and natural gas operations under section 111 were appropriate and by failing to set performance standards for new sources and guidelines for existing sources that curb emissions of methane from the oil and natural gas sector. The letter notified EPA that such failures were both a violation of a nondiscretionary duty under section 111 of the Act and constituted unreasonable delay in taking agency action.

46. In June 2013, President Obama issued a Climate Action Plan that, among other things, committed his administration to developing a comprehensive, interagency strategy to

reduce methane emissions. That strategy, released in March 2014, committed EPA to a number of activities, including assessing significant sources of methane and other emissions from the oil and natural gas sector, soliciting input from independent experts through a series of technical white papers, and determining how best to pursue further methane reductions from these sources. Because of EPA's actions demonstrating progress in addressing these sources, the Plaintiff States that had previously notified EPA of their intent to sue held the filing of a lawsuit in abeyance.

47. On April 15, 2014, EPA released five technical white papers regarding sources of and mitigation techniques to control methane and VOC emissions in the oil and natural gas sector. EPA sought independent peer review of the white papers and received more than 43,000 comments from the public, including several of the Plaintiff States. EPA stated that it intended to use the technical documents and public comments received to "solidify its understanding of these potentially significant sources," enabling the agency "to fully evaluate the range of options for cost-effectively cutting VOC and methane waste and emissions."

48. In September 2015, EPA proposed overdue regulations to require new and modified oil and natural gas facilities to meet standards to limit their methane emissions. 80 Fed. Reg. 56,593 (Sept. 18, 2015). Numerous Attorneys General submitted comments on the proposed standards for new and modified sources, and further urged EPA to move forward expeditiously with regulation of existing sources, which is mandated under the Act once a rule on new and modified sources is finalized.

49. On June 3, 2016, EPA finally promulgated much-delayed final performance standards for methane emissions from new and modified oil and natural gas sources. *Oil and Natural Gas Sector Emission Standards for New, Reconstructed and Modified Sources*, 81 Fed.

Reg. 35,824 (June 3, 2016) ("New Source Rule"). EPA's promulgation of those new source standards triggered its mandatory obligation under 42 U.S.C. § 7411(d) and 40 C.F.R. § 60.22(a) to issue existing source guidelines.

50. In recognition of that obligation, on the same day that it issued the New Source Rule, EPA published notice that it would be issuing an information collection request ("ICR") to obtain "more specific information that would be of critical use in addressing existing source emissions pursuant to CAA section 111(d)." 81 Fed. Reg, 35,763, 35,764 (June 3, 2016). After two rounds of notice and comment, and review by the Office of Management and Budget, resulting in narrower requests for information and lower compliance costs, EPA issued the Final Methane ICR on November 10, 2016. The ICR had two parts: (1) an operator survey, designed to obtain basic information from onshore oil and natural gas facilities to better understand the number and types of equipment at production facilities; and (2) a facility survey, sent to select oil and natural gas facilities to obtain more detailed information on sources of methane emissions and emissions control devices or practices. EPA began receiving the requested information from oil and natural gas operators in January 2017.

51. Nineteen months later, EPA has not yet fulfilled its mandatory obligation under the Act, outlined in 42 U.S.C. § 7411(d) and 40 C.F.R. § 60.22(a), to issue guidelines for the control of methane emissions from existing oil and natural gas sources once it promulgated the New Source Rule.

52. Quite the contrary, on March 2, 2017, one day after eleven states, mostly oil and gas-producing states, wrote to Administrator Pruitt requesting that he suspend and withdraw the ICR. Without any notice or opportunity for comment, EPA withdrew the Final Methane ICR.

82 Fed. Reg. 12,817 (Mar. 7, 2017). On April 3, 2017, several of the Plaintiff States submitted a letter to Administrator Pruitt objecting to the ICR withdrawal.

53. Further indicating its disinterest in regulating air pollutant emissions from existing oil and natural gas sources, on March 1, 2018, EPA proposed a complete withdrawal of its 2016 Control Techniques Guidelines ("CTGs") for the Oil and Natural Gas Industry. The CTGs are technical recommendations critical to reducing emissions of VOCs from existing oil and natural gas facilities, which would have the co-benefit of reducing some methane emissions. *See Notice of Proposed Withdrawal of the Control Techniques Guidelines for the Oil and Natural Gas Industry*, 83 Fed. Reg. 10,478 (Mar. 9, 2018).

CLAIM FOR RELIEF

Continuing Unreasonable Delay in Performing Mandatory Duty to Issue Emission Guidelines for Control of Methane Emissions from Existing Sources

54. The allegations set forth in the foregoing paragraphs are incorporated herein by reference.

55. As set forth above, EPA has a nondiscretionary legal duty to propose guidelines for methane emissions from existing facilities in the oil and natural gas sector when it issues standards of performance for methane emissions from new oil and natural gas sources.

56. After extensive agency delay, EPA finally promulgated standards of performance for methane emissions from new oil and natural gas sources in the final New Source Rule on June 3, 2016, but to date has failed to fulfill its corresponding obligation under section 111(d) to publish emission guidelines covering methane emissions from existing oil and natural gas sources.

57. EPA's failure has harmed and continues to harm Plaintiffs by delaying the adoption and implementation of methane standards for existing oil and natural gas operations

that would result in cleaner and healthier air in the States and that would reduce and delay the harmful impacts from climate change, to the benefit of Plaintiffs and the health and welfare of their citizens.

58. EPA has known since at least 1997 that oil and natural gas operations are one of the nation's largest methane sources.

59. EPA has known since at least 2009 that methane endangers public health and welfare because of its contribution to climate change.

60. EPA has long had ample data on cost-effective measures for controlling methane emissions from oil and natural gas sources, for example, through the Natural Gas STAR Program, which started in 1993.

61. Since at least 2011, EPA has been assessing the significant emissions of methane from oil and natural gas operations and evaluating actions to address those emissions. *See* 76 Fed. Reg. at 52,756 ("Although this proposed rule does not include standards for regulating [methane emissions], we continue to assess these significant emissions and evaluate appropriate actions for addressing these concerns.").

62. EPA also has a vast amount of scientific and technical data on emissions and control strategies developed over the last several years, including from its white papers, the Greenhouse Gas Reporting Program, and its 2016 CTGs for the Oil and Natural Gas Industry.

63. Notwithstanding the detailed information EPA already has in its possession, EPA has not established guidelines for controlling methane emissions from existing oil and natural gas sources.

64. EPA's delay in failing to establish methane emissions guidelines covering existing oil and natural gas sources as required by section 111(d) of the Act and EPA's

implementing regulations, 40 C.F.R. § 60.22(a), constitutes unreasonable delay in the performance of an act or duty within the meaning of section 304(a) of the Clean Air Act, 42 U.S.C. § 7604(a), which delay is ongoing as of the present time.

65. EPA's unreasonable delay in issuing these guidelines in turn delays both the date by which states must submit plans for the control of methane from existing oil and natural gas operations, 40 C.F.R. § 60.23(a), and the date by which existing sources must comply with approved pollution control standards, *see id.* § 60.24(c).

66. EPA's failure to issue required guidelines for states to develop plans to limit methane emissions from existing sources harms Plaintiffs and their citizens by delaying adoption of such plans, resulting in higher emissions of methane and other pollutants from existing sources in the oil and natural gas sector than would be permitted if EPA were to complete the required actions.

REQUESTED RELIEF

WHEREFORE, Plaintiffs respectfully request that this Court enter judgment against defendants as follows:

A. Declaring that EPA's failure to publish emission guidelines for the control of methane emissions from existing sources in the oil and natural gas sector, as required by section 111(d) of the Act, 42 U.S.C. § 7411(d), and EPA's implementing regulations, 40 C.F.R. § 60.22(a), constitutes agency action unreasonably delayed within the meaning of 42 U.S.C. § 7604(a), in violation of the Act;

B. Ordering EPA to propose and subsequently promulgate emission guidelines for methane emissions from existing sources in the oil and gas sector, in accordance with 42 U.S.C.

§ 7411(d) and 40 C.F.R. § 60.22(a), pursuant to an expeditious deadline established by this Court;

C. Retaining jurisdiction over this matter until such time as EPA has issued such guidelines;

D. Awarding Plaintiffs the costs of litigation, including reasonable attorneys' fees; and

E. Awarding such other relief as the Court deems just and proper.

Dated: April 5, 2018

FOR THE STATE OF NEW YORK

ERIC T. SCHNEIDERMAN
Attorney General

By:

/s/ Christopher C. Gore
MICHAEL J. MYERS
MORGAN A. COSTELLO
CHRISTOPHER C. GORE
Assistant Attorneys General
Environmental Protection Bureau
The Capitol
Albany, NY 12224
(518) 776-2392

FOR THE STATE OF CALIFORNIA

XAVIER BECERRA
Attorney General
Timothy E. Sullivan
Daniel M. Lucas
Kavita P. Lesser
Deputy Attorneys General
California Department of Justice
300 South Spring Street
Los Angeles, CA 90013
(213) 269-6605
Attorneys for the State of California, by and through the California Air Resources Board and Attorney General Xavier Becerra

FOR THE STATE OF CONNECTICUT

GEORGE JEPSEN
Attorney General
MATTHEW LEVINE
JILL LACEDONIA
Assistant Attorneys General
Office of the Attorney General
55 Elm Street
Hartford, CT 06141-0120
(860) 808-5250

FOR THE STATE OF ILLINOIS

LISA MADIGAN
Attorney General
MATTHEW DUNN
GERALD KARR
DANIEL ROTTENBERG
Assistant Attorneys General
Illinois Attorney General's Office
69 W. Washington St., 18th Floor
Chicago, IL 60602
(312) 814-0660

FOR THE STATE OF IOWA

TOM MILLER
Attorney General
JACOB LARSON
Assistant Attorney General
Environmental Law Division
Hoover State Office Building
1305 E. Walnut St., 2nd Floor
Des Moines, IA 50319
(515) 281-5341

FOR THE STATE OF MAINE

JANET T. MILLS
Attorney General
GERALD D. REID
Assistant Attorney General
Chief, Natural Resources Division
Maine Attorney General's Office
6 State House Station
Augusta, ME 04333-0006
(207) 626-8545

FOR THE STATE OF MARYLAND

BRIAN E. FROSH
Attorney General
LEAH J. TULIN
Assistant Attorney General
200 St. Paul Place
Baltimore, MD 21202
(410) 576-6962

FOR THE COMMONWEALTH OF MASSACHUSETTS

MAURA HEALEY
Attorney General
MELISSA HOFFER
Assistant Attorney General
Chief, Energy and Environment Bureau
Office of the Attorney General
One Ashburton Place, 18th Floor
Boston, MA 02108
(617) 727-2200

FOR THE STATE OF NEW MEXICO

HECTOR H. BALDERAS
Attorney General
WILLIAM GRANTHAM
BRIAN E. MCMATH
Consumer & Environmental Protection Division
New Mexico Office of the Attorney General
201 Third St. NW, Suite 300
Albuquerque, NM 87102
(505) 717-3500

FOR THE STATE OF OREGON

ELLEN F. ROSENBLUM
Attorney General
PAUL GARRAHAN
Attorney-in-Charge, Natural Resources Section
Oregon Department of Justice
1162 Court St. NE
Salem, OR 97301-4096
(503) 947-4593

FOR THE COMMONWEALTH OF PENNSYLVANIA

JOSH SHAPIRO
Attorney General
MICHAEL J. FISCHER
Chief Deputy Attorney General
ROBERT A. REILEY
Assistant Director, Pennsylvania
Department of Environmental Protection
Environmental Protection Section
Pennsylvania Office of the Attorney General
Strawberry Square
Harrisburg, PA 17120
(215) 560-2171

FOR THE STATE OF RHODE ISLAND

PETER F. KILMARTIN
Attorney General
GREGORY S. SCHULTZ
Special Assistant Attorney General
Rhode Island Department of Attorney General
150 South Main Street
Providence, RI 02903
(401) 274-4400

FOR THE STATE OF VERMONT

THOMAS J. DONOVAN, JR.
Attorney General
NICHOLAS F. PERSAMPIERI
Assistant Attorney General
Office of the Attorney General
109 State Street
Montpelier, VT 05609
(802) 828-3186

FOR THE STATE OF WASHINGTON

ROBERT W. FERGUSON
Attorney General
KATHARINE G. SHIREY
Assistant Attorney General
Washington State Attorney General's Office
PO Box 40117
Olympia, WA 98504
(360) 586-6769

FOR THE DISTRICT OF COLUMBIA

KARL A. RACINE
Attorney General
DAVID S. HOFFMAN
Assistant Attorney General
Office of the Attorney General
of the District of Columbia
441 Fourth St. NW Ste. 600-S
Washington, D.C. 20001
(202) 442-9889

FOR THE CITY OF CHICAGO

EDWARD N. SISKEL
Corporation Counsel
JARED POLICCHIO*
Supervising Assistant Corporation Counsel
30 N. LaSalle Street, Suite 800
Chicago, IL 60602
(312) 744-7764

*motion to appear pro hac vice to be submitted promptly

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

State of New York, *et al.*,	)	
Plaintiffs,	)	
v.	)	Civil Action No. 1:18-cv-0773
U.S. Environmental Protection Agency, *et al.*,	)	Hon. Reggie B. Walton
Defendants.	)	

DEFENDANTS' MEMORANDUM IN SUPPORT OF THEIR CROSS-MOTION FOR SUMMARY JUDGMENT AND IN OPPOSITION TO PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT

United States Department of Justice
Environment & Natural Resources Division

Dated: August 14, 2020

/s/ Heather E. Gange
HEATHER E. GANGE
D.C. Bar 452615
Environmental Defense Section
P.O. Box 7611
Washington, DC 20044
Tel. 202.514.4206
Heather.Gange@usdoj.gov

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INTRODUCTION

Plaintiffs have asserted an unreasonable delay claim pursuant to Clean Air Act ("CAA") Section 304(a), 42 U.S.C. § 7604(a), which grants the district courts "jurisdiction to compel. . . agency action unreasonably delayed." [1] EPA does not dispute that it was subject to a mandatory duty[2] to issue guidelines under which States would regulate methane emissions from existing sources in the oil and natural gas sector within their jurisdiction ("Methane Guidelines") until the underlying oil and natural gas new source performance standards for methane ("Methane NSPS") were rescinded in a final EPA rule signed on August 13, 2020 ("Final Rule").[3] Now that the Methane NSPS has been rescinded, however, EPA no longer has either the authority or a duty to issue Methane Guidelines. This case therefore is prudentially moot at this time. Once the Final Rule becomes effective upon publication in the Federal Register, which EPA expects to occur within several weeks, the case will be moot under Article III of the U.S. Constitution. Consequently, the case should be dismissed for lack of subject matter jurisdiction.

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[1] The unreasonable delay provision is found in the text below the enumerated list in 42 U.S.C. § 7604(a).

[2] That duty was not non-discretionary within the meaning of 42 U.S.C. § 7604(a), because EPA retains discretion as to the time frame within which to issue guideline documents under 40 C.F.R. § 60.22a. *See Sierra Club v. Thomas*, 828 F.2d 783, 790-91 (D.C. Cir. 1987) ("In the absence of a readily-ascertainable deadline . . . it will be almost impossible to conclude that Congress . . . deprive[d the agency] of all discretion over the timing of its work."); *City of Dover v. EPA*, 956 F. Supp.2d 272, 282-83 (D.D.C. 2013) (same). Plaintiffs therefore are mistaken when they refer to the duty at issue in this case as non-discretionary at page 15 of their opening brief and elsewhere.

[3] *See* "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed and Modified Sources," https://www.epa.gov/sites/production/files/2020-08/documents/frn_oil_and_gas_review_2060-at90_final_20200812_admin_web.pdf (last accessed on August 14, 2020), at 5-8.

Moreover, while the Court should dismiss the case without reaching the merits, EPA did not unreasonably delay its development of Methane Guidelines. Instead, EPA reasonably postponed preparation of Methane Guidelines during its review of the underlying Methane NSPS pursuant to Executive Order 13783 ("E.O. Review"). The underlying Methane NSPS is a necessary statutory prerequisite for finalizing Methane Guidelines. As EPA has explained throughout the case, the E.O. Review could result in: (1) rescission of the Methane NSPS, thereby eliminating EPA's authority and obligation to issue Methane Guidelines; or (2) revision to the underlying Methane NSPS, thereby affecting the substance of Methane Guidelines. Because of the possible impacts that the E.O. Review might have on the Methane Guidelines, EPA realized that efforts to develop Methane Guidelines before the E.O. Review was completed would likely be futile, and any time and resources devoted to those efforts would be largely or entirely wasted. As explained more fully below, EPA's decision therefore was reasonable, and if the case is not dismissed as moot, the court should find that EPA did not unreasonably delay issuing Methane Guidelines and grant the Agency's cross-motion for summary judgment.

Finally, EPA agrees with Plaintiffs that it is most appropriate to bifurcate liability and remedy based on the unique circumstances of this case. In the unlikely event that this case is not dismissed and EPA is found liable, EPA further agrees to submit a proposed schedule for appropriate action with respect to Methane Guidelines within 90 days after a decision on the merits.

I. BACKGROUND

A. Legal Background

Under Section 7411(b) of the CAA, EPA first promulgates standards of performance for *new* sources ("NSPS"). 42 U.S.C. § 7411(b)(1)(B). EPA does not promulgate performance standards for *existing* sources. Instead, CAA Section 7411(d) requires that EPA prescribe regulations to establish procedures under which *States* submit plans to establish, implement, and enforce standards of performance for existing sources "for any air pollutant . . . to which a [federal NSPS] would apply if such existing source were a new source…." *Id.* § 7411(d)(1).[4]

Under the procedure prescribed by the implementing regulations for CAA Section 7411(d), EPA first publishes a draft emission guideline for public comment "concurrently upon or after proposal" of the pertinent federal NSPS. 40 C.F.R. § 60.22a(a). After consideration of comments on the draft guideline "and upon or after" finalization of the pertinent federal NSPS, EPA finalizes and publishes the guideline in the Federal Register. *Id.* Within three years after publication of the final guideline, each State must submit to EPA either: (1) "a plan for the control of the designated pollutant to which the emission guideline applies" that includes performance standards and compliance schedules, among other things; or (2) a certification that the State contains no existing facilities that would be subject to the NSPS if they instead were new. *Id.* §§ 60.23a(a), (b), 60.24a. EPA evaluates the completeness of state submissions within six months, and approves or disapproves those that are complete within one year thereafter. *Id.* §

[4] EPA fulfilled this duty in 1975, publishing regulations that established the procedure for States to follow to develop plans for controlling a "designated pollutant." 40 Fed. Reg. 53,340 (Nov. 17, 1975) (codified at 40 C.F.R. pt. 60, subpt. B). EPA defines a "designated pollutant" as any air pollutant: (1) the emission of which is subject to a federal NSPS; and (2) which is neither a pollutant regulated under CAA Section 7408(a) (*i.e.,* criteria pollutants such as ground-level ozone and particulate matter, and their precursors, like volatile organic compounds ("VOC")) or a hazardous air pollutant ("HAP") regulated under CAA Section 7412, mirroring the statutory exclusion of these pollutants from regulation of existing sources under CAA section 111(d). 42 U.S.C. § 7411(d)(1), 40 C.F.R. § 60.21a(a).

Over the years, EPA has revised its CAA Section 7411(d) implementing regulations several times, most recently on July 8, 2019. 84 Fed. Reg. 32,520 (codified at 40 C.F.R. pt. 60, subpt. Ba). The recently amended regulations at Subpart Ba, rather than Subpart B, now govern the guidelines at issue in this case.

60.27a(g). Finally, if EPA disapproves a state's submittal or finds that a State failed to submit a plan, the Agency promulgates a federal plan within two years thereafter. *Id.* § 60.27a(c).

B. Factual Background

1. New Source Performance Standards

In June 2016 EPA published a final rule establishing both VOC and methane emission standards for various types of new sources in the oil and gas industry ("2016 NSPS"). 81 Fed. Reg. 35,824 (June 3, 2016). This was the first time that EPA had promulgated methane emissions standards for this industry.[5] The 2016 NSPS was immediately challenged by numerous parties (including 30 States) in the U.S. Court of Appeals for the District of Columbia Circuit ("D.C. Circuit"). *Am. Petroleum Inst. v. EPA*, No. 13-1108 (D.C. Cir. 2012) (consolidated with challenges to the prior NSPS for the oil and gas sector).

2. Emission Guidelines

At that time, EPA did not propose a draft emission guideline for state plans that would regulate methane emissions (the designated pollutant) from existing sources. *See* 42 U.S.C. § 7411(d)(1); 40 C.F.R. § 60.22a(a). However, EPA did issue an information collection request ("ICR") in November 2016 seeking information to, among other things, develop the Methane Guidelines. Soon after issuing the ICR, EPA started receiving numerous requests for extensions of the response deadlines and numerous complaints from recipients regarding the scope and applicability of the ICR. EPA had to establish a hotline to address recipient questions and help them respond to the ICR. Ex. A, Fed. R. Civ. P. 30(b)(6) Deposition of EPA, at 59; Ex. B, Deposition of Brenda Shine, at 135-38; Ex. C, Deposition of David Cozzie, at 122.

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[5] The term "2016 NSPS" refers to the entire rule finalized on June 3, 2016, whereas the earlier-defined term "Methane NSPS" refers only to the standards for methane emissions that are part of the 2016 NSPS.

Then, in late 2016 and early 2017, while EPA was still collecting data under the ICR and members of the new presidential administration were joining the Agency, some members of Congress, oil and gas industry representatives, and state attorneys general and governors were reaching out to EPA questioning whether the anticipated benefits from the ICR justified the approximately $42 million burden imposed on recipients. Ex. A, at 57-58; Ex. B, at 135-38; Ex. C, at 121-22.

EPA subsequently announced its withdrawal of the ICR in a Federal Register notice signed by newly appointed Administrator Pruitt on March 2, 2017. 82 Fed. Reg. 12,817 (Mar. 7, 2017). In that Notice, then-Administrator Pruitt explained that:

> The withdrawal is occurring because EPA would like to assess the need for the information that the agency was collecting through these requests, and reduce burdens on businesses while the Agency assesses such need. This also comes after the Agency received a letter on March 1, 2017 from nine state Attorneys General and the Governors of Mississippi and Kentucky, expressing concern with the burdens on businesses imposed by the pending requests. EPA takes these concerns seriously and is committed to strengthening its partnership with the states.

Id. EPA contemporaneously issued a press release announcing the withdrawal, and later posted announcements on publicly accessible Agency web pages, transmitted explanatory letters to the recipients of the ICR, and recorded an explanatory message for the Agency's ICR hotline. Ex. A, at 96-97. EPA ultimately collected approximately 4,500 Part 1 responses to the ICR (operator survey) and fewer than 10 Part 2 responses (detailed facility survey). Ex. C, at 7-10.

Several weeks after the ICR was withdrawn, the President issued Executive Order No. 13783. "Promoting Energy Independence and Economic Growth," 82 Fed. Reg. 16,093 (Mar. 31, 2017). Among other things, Executive Order 13783 specifically ordered EPA to "review the [Methane NSPS] and any rules and guidance issued pursuant to it, . . . and, if appropriate, [] as soon as practicable, suspend, revise or rescind the guidance, or publish for notice and comment proposed rules suspending, revising, or rescinding [the Methane NSPS]." *Id.* at 16,096, Sec. 7(a).

In accordance with this specific direction from the President, EPA initiated the E.O. Review of the 2016 NSPS (which includes the Methane NSPS) shortly thereafter. 82 Fed. Reg. 16,331 (Apr. 4, 2017). Since that time, EPA has not taken action specifically towards developing or issuing Methane Guidelines, because the E.O. Review could result in rescission of the Methane NSPS, which would eliminate EPA's authority to issue the Methane Guidelines; even revisions to the Methane NSPS could change the number and types of existing sources for which Methane Guidelines are required under 40 C.F.R. Part 60, Subpart Ba, thereby changing the scope and substantive content of the Guidelines. *See* 42 U.S.C. § 7411(d)(1); 40 C.F.R. §§ 60.21a(b), (e), 60.22a; Ex. D, Declaration of Peter Tsirigotis, dated September 27, 2019, ¶ 11; Ex. E, Declaration of Karl Moor, dated July 15, 2020, ¶ 11; Dkt. No. 48-2, at 5-7, 11, ¶¶ 1-3, 12 (Interrogatory Responses). Similarly, the U.S. Court of Appeals for the District of Columbia has been holding in abeyance legal challenges to the 2016 NSPS pending the conclusion of EPA's E.O. review. *Am. Petroleum Inst. v. EPA*, Case No. 13-1108, at Dkt. No. 1675813 (D.C. Cir.).

Based on the E.O. Review, EPA published a proposed rule on September 24, 2019, proposing two alternative sets of regulatory revisions to the 2016 NSPS. 84 Fed. Reg. 50,244. Both alternatives would have, among other things, rescinded the Methane NSPS. *See* 84 Fed. Reg. at 50,244, 50,246. The public comment period for the proposed rule closed on November 25, 2019, and EPA received in excess of 290,000 public comments, more than 2,600 of which were both substantive and non-duplicative. Ex. E, ⁋ 12. EPA completed its review of those comments and submitted the draft final rule to the Office of Management and Budget on May 29 under Executive Order 12866. *Id.* ⁋ 13.

On August 13, 2020, EPA completed its E.O. Review and signed the Final Rule that, among other things, rescinds the Methane NSPS. *Supra* n.3. The Final Rule, and thus the rescission of the Methane NSPS, will take effect upon publication in the Federal Register. *Id.* The Final Rule is reviewable only in the D.C. Circuit, and petitions for review must be filed within 60 days of its publication. 42 U.S.C. § 7607(b)(1).

3. Litigation Background

Plaintiffs filed their respective complaints on April 5 and May 30, 2018, asserting claims that EPA has unreasonably delayed issuing the Methane Guidelines. Dkt. Nos. 1, 20. EPA answered on July 31, 2018, Dkt.No. 29, and the parties subsequently engaged in discovery. EPA provided initial and amended disclosures under Federal Rule of Civil Procedure 26(a) that included the relevant portion of Executive Order 13783 and discussed the Agency's "ongoing efforts to prepare a proposed rule for publication that would propose to substantially revise or rescind the methane standards in the June 2016 NSPS as contemplated by Executive Order No. 13783 . . . 82 Fed. Reg. 16093, 16096 (March 31, 2017)." *See* Dkt. No. 48-4, at 3, 5.

EPA notified Plaintiffs and the Court when the Proposed Rule was signed on August 28, 2019, and moved to stay the remaining discovery and summary judgment briefing on the ground that the case was likely to be mooted if the Proposed Rule was finalized as proposed. Dkt. Nos. 58 (notice of proposed rulemaking), 59 (motion to stay). The Court granted that motion in part and vacated the initial summary judgment schedule, but denied the motion in part with respect to the pending discovery. Dkt. No. 68.

Document discovery closed in late November 2019, and depositions concluded in March 2020. EPA also has kept the Court and the parties apprised of the Agency's rulemaking progress through status reports. EPA alerted the Court in its May 15, 2020 status report that the Proposed

Rule likely would be finalized by the end of July 2020, a month later than originally anticipated. Dkt. No. 77. Plaintiffs then moved to reinstate summary judgment briefing over EPA's objection, despite the fact that it was likely the case would soon be mooted. Dkt. No. 78. The Court established a briefing schedule under which briefing will close on October 2, 2020. Dkt. No. 83.

STANDARD OF REVIEW

Ordinarily, a district court will grant summary judgment when there "is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(a); *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 247 (1986). Courts play a different role, however, where agency action or inaction is at issue. Where final agency action is at issue, the district court instead sits as an appellate tribunal to determine, based on the administrative record, whether the agency "examine[d] the relevant data and articulate[d] a satisfactory explanation for its action including a rational connection between the facts found and the choice made." *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (quoting *Burlington Truck Lines v. United States,* 371 U.S. 156, 168 (1962)). Review of "an agency's inaction . . . is still more limited." *Citizens for Responsibility & Ethics in Washington v. SEC*, 916 F. Supp.2d 141, 145 (D.D.C. 2013). When resolving claims that agency action was unreasonably delayed, the district courts "carry[] forward the traditional practice . . . of writs of mandamus." *Norton v. SUWA*, 542 U.S. 55, 63 (2004); *see Telecomm. Research & Action Ctr. v. FCC*, 70 F.2d 70, 79-80 (D.C. Cir. 1984) (hereafter "*TRAC*"); *Democracy Forward Found. v. Pompeo*, Case No. 1:19-cv-1773, 2020 WL 4219817 *2 (D.D.C. July 23, 2020) (quoting *Norton v. SUWA*). In the D.C. Circuit, district courts evaluate the reasonableness of an agency's alleged delay using the mandamus factors established in *TRAC*. 750 F.2d at 79-80.

ARGUMENT

I. THIS CASE IS NOW MOOT AND SHOULD BE DISMISSED FOR LACK OF SUBJECT MATTER JURISDICTION.

This case should now be dismissed for lack of subject matter jurisdiction because the Final Rule has rendered the case moot. More specifically, the Final Rule has eliminated both EPA's obligation and its authority to issue the Methane Guidelines by rescinding the Methane NSPS. Under CAA section 7411(d) and its implementing regulations, EPA promulgates guidelines for existing sources "for any pollutant . . . *to which a [federal NSPS] would apply* if such existing source were a new source." 42 U.S.C. § 7411(d) (emphasis added). States then establish standards of performance for existing sources in state plans that must be consistent with EPA's guidelines. *See* 40 C.F.R. § 60.23a. EPA is only required to publish guidelines for "designated pollutants," which are "any air pollutant, the emissions of which are *subject to a standard of performance for new stationary sources*," and which meet certain other statutory criteria not relevant here. *Id.* § 60.21a(a) (emphasis added). Because the Final Rule rescinded the Methane NSPS, methane is no longer a "designated pollutant" and EPA no longer has an obligation or authority to issue Methane Guidelines.

The only remedy the Court could have granted Plaintiffs in this unreasonable delay case would have been an order establishing a schedule for EPA to fulfill its former obligation to issue Methane Guidelines. *See* 42 U.S.C. § 7604(a) (granting district courts "jurisdiction to compel . . . agency action unreasonably delayed"); *New York Public Interest Group v. Whitman*, 214 F. Supp.2d 1, 3-4 (D.D.C. 2002); *Sierra Club v. Browner*, 130 F. Supp.2d 78, 89-90 (D.D.C. 2001), aff'd, 285 F.3d 63 (D.C. Cir. 2002). Because EPA no longer has an obligation or the authority to issue such guidelines, the Court can no longer award relief that would redress Plaintiffs' alleged injuries. *See Izaak Walton League of Am. v. Johnson,* 400 F. Supp.2d 38, 41-42 (D.D.C. 2005) (internal citations omitted).

For the short time before the Final Rule is published in the Federal Register, at which time the Final Rule takes effect, the case is prudentially moot because "it is so unlikely that the court's grant of [a remedy] will actually relieve the injury" of which Plaintiffs complain. *See Penthouse Int'l, Ltd. v. Meese*, 939 F.2d 1011, 1019-20 (D.C. Cir. 1991) (internal citations omitted). Once the Final Rule becomes effective, that "intervening event [will] make it impossible to grant [Plaintiffs] effective relief" under 42 U.S.C. § 7604(a), as no live controversy will remain. *Lemon v. Geren*, 514 F.3d 1312, 1315 (D.C. Cir. 2008); *see Am. Bar Ass'n v. FTC*, 636 F.3d 641, 645 (D.C. Cir. 2011). At that time, the case will be moot under Article III of the Constitution, and the Court must dismiss it at that time without reaching the merits. *Already, LLC v. Nike, Inc*., 568 U.S. 85, 90-91 (2013) (citing *Murphy v. Hunt*, 455 U.S. 478, 481 (1982) and *Alvarez v. Smith*, 558 U.S. 87, 92-93 (2009)); *Cierco v. Mnuchin*, 857 F.3d 407, 414 (D.C. Cir. 2017). In the meantime, the Court should dismiss the case because it is prudentially moot. *See Penthouse*, 939 F.2d at 1019-20.

II. EPA REASONABLY POSTPONED GUIDELINE PREPARATION DURING THE E.O. REVIEW.

Because the case is prudentially moot now and should be dismissed without reaching the merits, the parties should no longer need to brief either liability or remedy. Out of an abundance of caution, however, EPA details below why it decided, *after receiving Executive Order 13783*, to postpone further preparation of the Methane Guidelines. Plaintiffs are simply mistaken when they argue that withdrawing the ICR constituted a decision to halt preparation of the Methane Guidelines. EPA further explains why the decision to halt their preparation was both objectively reasonable and reasonable under the six-factor test established in *TRAC*, 750 F.2d at 79-80. If the Court were to reach the merits of Plaintiffs' unreasonable delay claim (which it should not), Plaintiffs' motion for summary judgment should be denied and EPA's cross-motion for summary judgment should be granted.

A. EPA's Decision to Postpone Guideline Development during the E.O. Review Was Objectively Reasonable.

As EPA has explained throughout this case, the Agency began taking initial steps to develop Methane Guidelines around the time it issued the Methane NSPS in June 2016 and only postponed that process after initiating the E.O. Review in April 2017. An early step in that guideline development process was the issuance of the two-part ICR in November 2016. Soon thereafter, EPA began receiving numerous complaints and requests to withdraw the ICR from recipients, members of Congress, oil and gas industry representatives, state attorneys general, and governors based on the ICR's scope and applicability, the difficulty of responding, and the approximately $42 million burden on recipients. *Supra,* at 4-5. EPA soon had to establish a hotline to address recipient questions and complaints and help them respond. *Id.* Nonetheless, the Agency collected approximately 4,500 Part 1 responses and fewer than 10 Part 2 responses before withdrawing the ICR in March 2017:

> The withdrawal is occurring because EPA would like to assess the need for the information that the agency was collecting through these requests, and reduce burdens on businesses while the Agency assesses such need. This also comes after the Agency received a letter on March 1, 2017 from nine state Attorneys General and the Governors of Mississippi and Kentucky, expressing concern with the burdens on businesses imposed by the pending requests.

82 Fed. Reg. 12,817 (Mar. 7, 2020); Ex. A, at 63.

Several weeks later, before EPA could decide how to assess its need (if any) for the remaining uncollected information, the President issued Executive Order 13783. 82 Fed. Reg.

16,093. Among other things, that Executive Order instructed EPA to review the Methane NSPS and "if appropriate, . . . as soon as practicable . . . publish for notice and comment proposed rules suspending, revising, or rescinding" it. *Id.* at 16,096 Sec. 7(a). EPA formally initiated that review, the "E.O. Review," on April 4, 2017. 82 Fed. Reg. 16,331.

EPA realized that, for the reasons explained *supra* at 6 and 9-10, the Agency would no longer be authorized, much less obligated, to issue Methane Guidelines if the E.O. Review resulted in a rule that rescinded the Methane NSPS. In that situation, continuing to develop Methane Guidelines would be futile and consume scarce time and other Agency resources. Similarly, the universe of regulated sources—and therefore the substantive content of the Methane Guidelines—was likely to change if the E.O. Review resulted in a rule that revised the Methane NSPS. In that situation, the substantive content of the Methane Guidelines essentially would be a moving target until the E.O. Review concluded. And again, ongoing efforts to develop Methane Guidelines could be rendered partially or entirely futile.

For both of these reasons, EPA decided not to take *any* further steps specifically towards developing Methane Guidelines in parallel with the E.O. Review. This included the assessment of whether additional information actually needed to be collected under the ICR. Dkt. No. 48-2, at 10-11 (Response to Interrogatory No. 10). EPA explained this decision in its written discovery responses:

> EPA has not taken *any action* specifically towards developing or issuing guidelines for existing oil and natural gas sources since the Agency initiated the E.O. Review. Because the E.O. Review could result in the suspension, revision, or rescission of the methane standards in the 2016 NSPS, thereby potentially affecting the substance of potential future guidelines for existing oil and natural gas sources, and/or eliminating or curtailing EPA's authority to issue such guidelines, EPA at this time does not intend to issue such guidelines or to take actions specifically toward developing and issuing such guidelines before completing the E.O. Review.

Dkt. No. 48-2, Feb. 28, 2019, at 5-6 (Response to Interrogatory No. 1) (emphasis added); *see id.* at 10-11 (Response to Interrogatory No. 10). EPA reiterated this in its September 2019 motion to stay this case, in its recent position paper defending assertions of the deliberative process privilege for five documents, and its opposition to summary judgment briefing on the cusp of issuing the Final Rule. Dkt. No. 59, at 4, 8-9, 10 & n.8 (Motion to stay); Dkt. No. 75, at 3-4 (Position paper); Dkt. No. 80, at 1-3 (Opposition to motion for briefing schedule). Plaintiffs are simply incorrect when they argue that EPA "reversed its decision to issue [Methane Guidelines]" when it withdrew the ICR (as opposed to merely postponing their development), and that EPA has not explained why it did not take action on the Guidelines in parallel with the E.O. Review. *Id.* at 19, 22-26.

In sum, withdrawing the ICR did not halt EPA's development of the Methane Guidelines or prevent the Agency from pursuing them. Instead, Executive Order 13783—which EPA received just three weeks after withdrawing the ICR—and the intervening E.O. Review caused EPA to postpone that process. And EPA's concerns were well founded, as the E.O. Review led to, among other things, the Proposed Rule to rescind the Methane NSPS on two alternative grounds. *Supra,* at 6-7. After a public comment process in which the Agency received over 290,000 comments, more than 2,600 of which were substantive and non-duplicative, and inter-agency review coordinated by the Office of Management & Budget, EPA signed the Final Rule on August 13, 2020. *Id.* As EPA anticipated was a distinct possibility, the E.O. Review resulted in a Final Rule that rescinded the Methane NSPS. Had EPA taken any actions towards issuing the Methane Guidelines in the interim, those actions would have been rendered futile and all time and other resources invested in them would have been wasted. The same would have been true of time and resources expended by the regulated community had EPA required additional information under an ICR, and later by States as they began developing plans in response to the Methane Guidelines before the Methane NSPS were rescinded. EPA's decision to postpone action on the Methane Guidelines during the E.O. Review was therefore eminently reasonable.

B. EPA's Decision Also Was Reasonable Based on the Factors Established in the D.C. Circuit's *TRAC* decision.

Contrary to Plaintiffs' allegations, EPA's decision to postpone action on the Methane Guidelines until the E.O. Review was complete also is reasonable under the factors established in the D.C. Circuit's *TRAC* decision: (1) the time agencies take must be governed by a "rule of reason"; (2) whether Congress has provided a timetable or other indicia of the speed with which it expects the agency to proceed in the enabling statute; (3) whether alleged delay occurs in the sphere of economic regulation versus human health and welfare; (4) the effect of expediting a delayed action on agency activities of a higher or competing priority; (5) the nature and extent of the interests prejudiced by delay; and (6) the court need not "find any impropriety lurking behind agency lassitude in order to hold that agency action is 'unreasonably delayed.'" *TRAC,* 750 F.2d at 79-80 (numerous internal citations omitted). District courts use these "*TRAC* factors" to evaluate the reasonableness of alleged delay under 42 U.S.C. § 7604(a). *See, e.g.*, *Didban v. Pompeo*, 435 F. Supp.3d 168, 175 (D.D.C. 2020); *Geneme v. Holder*, 935 F. Supp.2d 184, 192 (D.D.C. 2013).

1. EPA's decision to postpone development of the Methane Guidelines pending completion of the E.O. Review was governed by a "rule of reason."

EPA's decision to postpone developing Methane Guidelines until the E.O. Review concluded was informed by the Agency's well-reasoned and clearly articulated assessment of the several possible outcomes of the review it was required, as directed by the President, to perform under Executive Order 13783, and their potential impacts on the Methane Guidelines. As detailed *supra* at 11-14, it simply made no sense for EPA to expend agency time and resources developing guidelines—much less require the States and the regulated community to expend significant amounts of their own time and resources—while EPA had reason to believe that it could lose its authority to issue the guidelines altogether and while the substantive content of the guidelines was uncertain due to potential modifications to the underlying Methane NSPS. EPA firmly believes that that decision was reasonable given the unique circumstances presented by the E.O. Review.

Plaintiffs' arguments at pages 21-26 and 34-39 of their opening brief not only lack merit, but also are inapposite and outside the scope of this lawsuit, much less the first *TRAC* factor. In these portions of their opening brief, Plaintiffs ask the Court to assess the reasonableness of the decision at issue—postponing development of the Methane Guidelines until the E.O. Review concluded—based on this Court's assessment of the reasonableness of *different* EPA actions that are not properly before this Court now or at any other time (*e.g.*, the E.O. Review itself, proposed and final administrative stays of limited aspects of the 2016 NSPS, and the Proposed Rule (which now has been superseded by the Final Rule). First, it is black letter law that agency actions stand or fall on the rationale proffered by that agency, and EPA's liability defense therefore stands or falls on the basis that EPA has clearly articulated in sworn interrogatory responses, sworn declarations, and Fed. R. Civ. P. 30(b)(6) testimony throughout this case and concurrently with the E.O. Review. *See Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 50 (internal citations omitted); *see e.g., Fisher v. Pension Benefit Guaranty Corp.*, __ F. Supp.3d __, 2020 WL 3402337 *6 (D.D.C. June 19, 2020) (citing *NAACP v. Trump*, 315 F. Supp.3d 457, 467 n.7 (D.D.C. 2018)) (contemporaneous agency explanations are properly considered). For this reason alone, Plaintiffs' arguments are inapposite and cannot be used to challenge the reasonableness of EPA's decision to postpone preparing Methane Guidelines until the E.O. Review concluded.

Moreover, Plaintiffs cannot seek a district court ruling regarding the reasonableness of those different Agency actions in the guise of an unreasonable delay suit seeking a deadline for preparation of the Methane Guidelines. The only *bona fide* issue that was properly before this Court—until the case was mooted—was whether EPA unreasonably delayed issuing the *Methane Guidelines*. Moreover, the different EPA actions cited by Plaintiffs could not be challenged in this Court, even in separate lawsuits. Clean Air Act section 7607(b)(1) specifies that NSPS and amendments thereto (*e.g.,* the Final Rule) and other nationally applicable rules and final actions taken by EPA can only be challenged in the D.C. Circuit within 60 days after their publication in the Federal Register. 42 U.S.C. § 7607(b)(1); *see Izaak Walton League,* 400 F. Supp.2d at 41-42 (internal citations omitted). Indeed, the 2016 NSPS and EPA's 90-day administrative stay of limited aspects of the 2016 NSPS already *were* challenged in the D.C. Circuit, and the D.C. Circuit has exclusive jurisdiction over any objections Plaintiffs have to the Final Rule. *See Am. Petroleum Inst. v. EPA*, No. 13-1108 (D.C. Cir. 2012) (consolidated challenges to 2016 NSPS with challenges to prior NSPS for the oil and gas sector); *Clean Air Council v. Pruitt*, 862 F.3d 1 (D.C. Cir. 2017) (challenge to the 90-day administrative stay of limited aspects of the 2016 NSPS).

Further, Plaintiffs' reliance on EPA's withdrawal of the ICR and their numerous invitations to the Court to opine as to its reasonableness is a red herring and a distraction from EPA's stated reason for postponing development of the Methane Guidelines—the E.O. Review. Withdrawing the ICR could not have halted guideline development absent a separate agency decision to that effect, because neither CAA section 111(d) nor its implementing regulations require an ICR as part of the guideline development process. In addition, the Federal Register notice announcing the ICR withdrawal clearly stated that the purpose for the withdrawal was to enable EPA to "assess the need for the information that the agency was collecting through these requests, and reduce burdens on businesses while the Agency assesses such need." 82 Fed. Reg. 12,817. That notice never mentioned the Methane Guidelines, much less expressed any intention to halt their development. Moreover, none of the materials that Plaintiffs cite at pages 22-26 and 34-36 of their opening brief establish that the ICR was withdrawn for any reason other than the reason stated in the Federal Register notice. As such, Plaintiffs' claims that EPA reversed its decision to issue Methane Guidelines or otherwise halted its work on Methane Guidelines is entirely unsupported.

For all of these reasons, the only *bona fide* inquiry with respect to the first *TRAC* factor is whether EPA's decision to postpone developing the Methane Guidelines during the E.O. Review was governed by a rule of reason. Clearly it was, as EPA has explained throughout this case, and the first *TRAC* factor therefore weighs heavily in favor of EPA's decision.

2. Congress provided no timetable for the development of the Methane Guidelines.

Contrary to Plaintiffs' claim that Congress intended EPA to act promptly to develop guidelines for existing sources, Congress provided no such directive. Clean Air Act section 7411(d) merely instructs EPA to promulgate regulations establishing a procedure under which States submit plans establishing performance standards for existing sources. EPA did so in 1975 by promulgating 40 C.F.R. Part 60, Subpart B. 40 Fed. Reg. 53,340 (Nov. 17, 1975). In turn, the current implementing regulations merely say that proposed guidelines can be issued "[c]oncurrently upon or after" the underlying NSPS are proposed, and that final guidelines can be issued "upon or after" the NSPS is finalized. 40 C.F.R. § 60.22a(a). To the extent this language speaks to the timeframe for guidelines, it clarifies that there is no preferred time frame for proposing or finalizing them.[6] Indeed, the 1989 rule that amended 40 C.F.R. § 60.22 to allow guidelines to be proposed "[c]oncurrently upon or after" NSPS was expressly intended to "provide EPA the *flexibility* to publish draft guidelines at the same time or after [NSPS] are proposed." 54 Fed. Reg. 52,188/2-3 (Dec. 20, 1989) (emphasis added).

In contrast, Congress imposed clear deadlines on EPA in an earlier subsection of the very same CAA provision—42 U.S.C. § 7411(b)(1)(B). In that earlier subsection, Congress requires EPA to propose NSPS within one year after listing a new category of stationary sources that cause or contribute to air pollution that may harm human health or welfare, and further requires EPA to finalize such NSPS within one more year. Clearly then, when Congress intended that EPA act within particular timeframes, it expressly imposed that requirement in the statutory text.

Plaintiffs' argument that Congress intended to limit delays in guideline preparation to three months also lacks merit. Dkt. No. 85-2, at 18-19. Clean Air Act Section 7607(d)(7)(B) among other things allows EPA to stay the effectiveness of a challenged final rule or procedure for up to three months during reconsideration. 42 U.S.C. § 7607(d)(7)(B). On its face, this provision does not apply to the Methane Guidelines, which were never drafted or proposed, much less finalized, and therefore have never been challenged or reconsidered. Plaintiffs implicitly admit this when they try to characterize EPA's decision to postpone preparing the Methane Guidelines as a stay of the now-rescinded Methane NSPS. Dkt.No. 58-2, at 19-20.

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[6] Plaintiffs also are mistaken when they argue that EPA customarily issues guidelines concurrently with an NSPS. Dkt. No. 85-2, at 21& n.4. For example, nearly six years passed between issuance of the NSPS for sulfuric acid mist (36 Fed. Reg. 24,876 (Dec. 23, 1971)) and the associated guidelines (42 Fed. Reg. 55,796 (Oct. 18, 1977)), and more than four years passed between issuance of the NSPS for primary aluminum plants (41 Fed. Reg. 3826 (Jan. 26, 1976)) and the associated guidelines (45 Fed. Reg. 26,294 (Apr. 17, 1980)).

That characterization makes no sense, because the Methane NSPS—as their name clearly indicates—are standards for *new* sources. In contrast, the Methane Guidelines would have instructed States as the States developed plans imposing standards for *existing* sources. Nothing about the development of the Methane Guidelines, or lack thereof, would have any effect whatsoever on the regulation of new sources by the Methane NSPS.

While Plaintiffs clearly would have preferred that EPA issue Methane Guidelines more swiftly, they do not (because they cannot) identify any specific, applicable timeframe in the CAA. The second *TRAC* factor therefore weighs in favor of EPA's decision to postpone developing the Methane Guidelines until the E.O. Review concluded.

3. The interests at issue do not weigh against EPA's decision to postpone development of the Methane Guidelines pending completion of the E.O. Review.

With respect to the third and fifth *TRAC* factors,[7] whether the action at issue concerns human health and welfare and the interests allegedly prejudiced by delay, EPA acknowledges that—had the Methane NSPS not been rescinded—the Methane Guidelines would have assisted *States* as the *States* regulated methane emissions from existing sources in their jurisdictions. EPA disputes Plaintiffs' allegations of harm in their opening brief, however. As Plaintiffs admit at pages 42-43 of their opening brief, and the State of Colorado admits in its *amicus* brief at 5-11, some States have been regulating methane emissions from existing sources for many years without Methane Guidelines. States therefore have not been prejudiced by the alleged delay, and

[7] The fourth *TRAC* factor, the effect of expediting agency action on competing or higher priorities, is not pertinent to this case. EPA has taken the position throughout this case that competing priorities and resource limitations did not factor into the Agency's decision to postpone developing the Methane Guidelines.

they do not need Methane Guidelines to prevent harm to themselves or to their citizens that they attribute to methane emissions from existing sources.

Moreover, it is not reasonable to expect guideline-related emission reductions until approved State plans actually are implemented, and States do not even have to submit plans for EPA review until three years after final guidelines are issued. *See* 40 C.F.R. §§ 60.23a(a), (b), 60.24a. EPA also has up to 18 months to determine that State submittals are complete and then approve or disapprove them; if any plan is disapproved, EPA has another two years thereafter to promulgate a Federal Plan. *Id.* § 60.27a(b). In addition, States can allow existing sources at least two years from plan submission, and in some cases more time, to come into compliance once their plans are approved by EPA. *Id*. § 60.24a(d). Assuming solely for the sake of argument that EPA was on the cusp of finalizing Methane Guideline when Executive Order 13783 issued—which EPA clearly was not—proposed state plans would not have been due to EPA for a completeness determination and subsequent review until early *this summer*. Therefore, it could be another two years (and longer still if EPA had to issue a Federal Plan) before there would be any Guideline-related emission reductions. Consequently no harm whatsoever could reasonably be attributed to a lack of Methane Guidelines right now or even in the near future.[8] The allegations of harm in Plaintiffs' opening brief are therefore both inaccurate and misleading.

[8] Plaintiffs also are mistaken to the extent they attribute harm from emissions of HAP and VOC to the lack of Methane Guidelines. Dkt. No. 85-2, at 29-30. As explained *supra* at n.4, these pollutants are expressly excluded from regulation under 42 U.S.C. § 7411(d) and its implementing regulations.

For all of these reasons, the third and fifth TRAC factors do not weigh against the reasonableness of EPA's decision to postpone developing the Methane Guidelines until the E.O. Review concluded.

4. There was no impropriety in EPA's decision to postpone development of the Methane Guidelines.

The sixth TRAC factor—that the court can find agency action was unreasonably delayed even absent an improper motive—also does not weigh against EPA. EPA's decision to postpone development of the Methane Guidelines was based upon the Agency's understanding that any actions taken with respect to those guidelines could be rendered futile, in whole or in part, by rules issued pursuant to the E.O. Review. Plaintiffs' contrary arguments boil down to fundamental disagreement with the Methane NSPS-related requirements that the President imposed on EPA through Executive Order 13783. Because of this disagreement, Plaintiffs consider EPA's efforts to fulfill those requirements to be improperly motivated. That simply is not correct, however, since EPA is an executive agency which cannot disregard orders from the Chief Executive. *See Sherley v. Sebelious*, 689 F.3d 776, 784-85 (D.C. Cir. 2012) (citing *Bldg. & Const. Trades Dep't v. Allbaugh*, 295 F.3d 28, 32-33 (D.C. Cir. 2002)) ("[A]s an agency under the direction of the executive branch, [EPA] must implement the President's policy directives to the extent permitted by law."). Instead, EPA's decision not to squander agency resources on Guideline-related efforts that could be rendered futile by the E.O. Review was motivated by practicality and the need to responsibly steward scarce resources.

Plaintiffs cannot nullify EPA's reasoned explanation for postponing guideline development by hypothesizing an elaborate scheme to forestall issuance of the Methane Guidelines through the ICR withdrawal, the E.O. Review and Final Rule, and stays of the 2016 NSPS. Dkt. No. 85-2, at 34-39. Aside from being wildly improbable, this hypothesis ignores the fact that each action had its own clearly articulated purpose—which was not forestalling Methane Guidelines. As explained *supra* at 4-5 and 11-14, EPA withdrew the ICR to assess the need for the remaining information versus the nearly $42 million burden imposed on its recipients. The Chief Executive imposed the E.O. Review on EPA to assess, among other things, the consistency of the 2016 NSPS with policies expressed in Executive Order 13783, with the Final Rule being a product of that review. Finally, the administrative 90-day stay, and the proposed two-year stay that EPA never finalized,[9] both pertain to certain standards for *new sources* in the 2016 NSPS that EPA was reconsidering pursuant to numerous administrative petitions filed under CAA Section 7607(d)(7)(B). All of those actions were separate and independent of EPA's duty to issue Methane Guidelines for *existing sources*, and Plaintiffs' hypothesis simply does not withstand scrutiny.

For all of these reasons, there is no "disconnect between the decision made and the explanation given," as there was in the *Department of Commerce v. New York* case that Plaintiffs cite at page 32 of their opening brief. 139 S. Ct. 2551, 2575 (2019). And as that court emphasized, "a court may not reject an agency's stated reasons for acting simply because the agency might also have had other unstated reasons." *Id.* at 2573.[10] The present situation also differs significantly from *Tummino v. Von Eschenbach*, where a disconnect between the records of FDA's review of an application for over-the-counter drug access and the stated rationale for

[9] Also, in *Clean Air Council v. Pruitt*, the Court "emphasize[d] that nothing in [its opinion in vacating the 90-day administrative stay] in any way limits EPA's authority to reconsider the final rule and to proceed with its [proposed two-year stay]." 862 F.3d at 14.

[10] The *New York* case is also inapposite because it does not address agency action allegedly delayed (*i.e.*, not taken) and the *TRAC* factors under which alleged delay is evaluated. Instead, that decision addresses final agency action and the completely different "arbitrary and capricious" standard applied to the accompanying administrative record. 139 S. Ct. 2551 (2019).

the agency's disposition of that application prompted the court to allow discovery beyond the administrative record. 427 F. Supp.2d 212, 231 (E.D.N.Y. 2006). Here, in contrast, Plaintiffs cannot point to any evidence (because none exists) contradicting EPA's clear and consistent statement—in sworn interrogatory responses, Fed. R. Civ. P. 30(b)(6) testimony and declarations and filings—that the Agency decided to stop developing Methane Guidelines until the E.O. Review concluded to avoid squandering resources on efforts that the E.O. Review likely would render futile.

Moreover, Plaintiffs' allegations that the basis for the Proposed Rule rescinding the Methane NSPS is pretextual are not properly before this Court, and the cases that Plaintiffs cite in support of those allegations therefore are inapposite. *See* Dkt. No. 85-2, at 37-39. The final version of that rule was signed on August 13, 2020, and the D.C. Circuit has exclusive jurisdiction over objections to the Final Rule. 42 U.S.C. § 7607(b)(1); *see also Izaak Walton League,* 400 F. Supp.2d at 41-42 (internal citations omitted). Moreover, *this case* has nothing to do with potential judicial review of the Final Rule in the D.C. Circuit, or related arguments over which the D.C. Circuit has exclusive jurisdiction. This case is about whether EPA reasonably decided to postpone issuing the *Methane Guidelines* for the forthright and practical reasons that EPA has articulated throughout this case and the concurrent E.O. Review.

As the sixth *TRAC* factor instructs, the Court need not find that EPA acted improperly or with malicious intent in order to find that the Agency's decision was not reasonable. For all of the reasons discussed above, there simply is no credible basis to conclude that EPA engaged in an elaborate and improper scheme to avoid issuing the Methane Guidelines. The sixth *TRAC* factor therefore simply is not relevant in this case.

* * *

For all of the foregoing reasons, if the Court does not find that the case is moot, the Court should find that EPA reasonably decided to postpone development of the Methane Guidelines until after the E.O. Review was complete. Plaintiffs' motion therefore should be denied on the merits and EPA's cross motion for summary judgment should be granted.

III. THE COURT SHOULD BIFURCATE LIABILITY AND REMEDY AS PLAINTIFFS PROPOSE.

In their opening brief, Plaintiffs ask the Court to bifurcate the liability and remedy phases of this case. More specifically, Plaintiffs ask the Court to instruct EPA to submit its proposed schedule within 30 days if the Court were to issue a decision finding EPA liable, at which time Plaintiffs would voice their objections thereto and the Court would establish a schedule for EPA action with regular status reporting. *See* Dkt.No. 85-2, at 39-42. While parties customarily brief liability and remedy simultaneously in unreasonable delay suits under CAA section 304(a), 42 U.S.C. § 7604(a), EPA agrees that bifurcating liability and remedy is most appropriate in this particular case.

Remedy briefing in unreasonable delay suits is lengthy, time-consuming, and is unnecessary in this case now that it has been mooted by the Final Rule. While EPA does not agree with Plaintiffs' general representations regarding guideline development at pages 41-44, it makes no sense to expend the parties' and the Court's resources parsing the steps and associated time frames for the guideline development process. In the unlikely event that the case is not found to be moot, and EPA is found liable, EPA therefore requests that the Court bifurcate liability and remedy as Plaintiffs request and instruct the Agency to submit a proposed schedule within 90 days thereafter, rather than 30.

In its Rule 30(b)(6) deposition, in its interrogatory responses, and in a sworn declaration from the head of the EPA program that would have prepared the guidelines at issue, EPA detailed the shortest possible time frames within which it could issue Methane Guidelines: a minimum of 90 days to determine whether a new ICR would be necessary, after which the Agency requires either a longer (including an ICR) or a shorter (without an ICR) time frame to develop and issue Methane Guidelines. Ex. A, at 245-55 & Exhibits 49-50. Plaintiffs' 30-day proposal is based on an erroneous and unsubstantiated allegation that EPA could instead determine whether or not an ICR is needed within 30 days, rather than 90. To avoid having to make a hasty and potentially inaccurate determination that might compromise any future guidelines, EPA would need to begin assessing its need for an ICR far enough in advance of this Court's decision so that the Agency could complete that assessment within 30 days post-decision.[11]

This is an absurd position to place EPA in, not only because EPA reasonably anticipates that the case will be found moot under Article III for the reasons discussed *supra* at 9-10, but also because the Agency reasonably anticipates that it will not be found liable even if the case is not moot. Moreover, based on the Final Rule, EPA does not believe that it even has the authority to issue Methane Guidelines. Hence, all time and resources devoted to such efforts prior to a merits decision would be wasted. EPA therefore requests that, if the case is not dismissed and EPA is found liable, the Agency be instructed to submit a proposed schedule within 90 days after a decision on the merits for whatever action is appropriate with respect to Methane Guidelines at that time.

[11] The Court indicated during the June 18, 2020, conference and in its Order of June 18, 2020 (Dkt.No. 83), that the parties' cross motions for summary judgment would not be resolved before January 8, 2021, and possibly later.

CONCLUSION

For all of the above reasons, Plaintiffs' motion for summary judgement should be denied and EPA's cross-motion for summary judgment should be granted.

Respectfully Submitted,

United States Department of Justice
Environment & Natural Resources Division

Dated: August 14, 2020

/s/ Heather E. Gange
HEATHER E. GANGE
D.C. Bar 452615
Environmental Defense Section
P.O. Box 7611
Washington, DC 20044
Tel. 202.514.4206
Heather.Gange@usdoj.gov

CERTIFICATE OF SERVICE

I hereby certify that on this 14th day of August, 2020, I caused a copy of the foregoing document to be served by the Court's CM/ECF system on all counsel of record in this matter as more fully reflect in the ECF notice of filing.

/s/ Heather E. Gange
Heather E. Gange