UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Reconsideration	)	**Docket No. EPA-HQ-OAR-2017-0483** *Via email* *April 13, 2020*
Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review	)	**Docket No. EPA-HQ-OAR-2017-0757** *Via email* *April 13, 2020*

We submit these supplemental comments on behalf of Environmental Defense Fund ("EDF"), Clean Air Council, Clean Air Task Force, Earthjustice, Earthworks, Environmental Integrity Project, National Parks Conservation Association, Natural Resources Defense Council, and Sierra Club on the Environmental Protection Agency's ("EPA") proposed rules entitled *Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Reconsideration*, 83 Fed. Reg. 52,056 (Oct. 15, 2018) ("Reconsideration Proposal") and *Oil and Natural Gas Sector: Emissions Standards for New, Reconstructed, and Modified Sources Review*, 84 Fed. Reg. 50,244 (Sept. 24, 2019) ("Methane Rescission Proposal"). Since the close of the comment periods for these proposals, additional information has become available that further underscores the misguided and deeply flawed nature of the agency's proposals to weaken core oil and gas standards, remove regulation of methane, and eliminate any standards for the transmission and storage segment of the oil and gas sector. In particular, Section I describes recent action in Colorado strengthening state requirements for leak detection and repair ("LDAR"), which demonstrate that more frequent surveys deliver significant benefits, including at lower producing sources. Sections II & III respond to comments submitted by the American Petroleum Institute ("API") and the Independent Petroleum Association of America ("IPAA") and address claims in these comments concerning the benefits of existing source standards and the impacts of standards at low producing wells. Finally, Section IV details EPA's failure to consider the impacts of its proposals on frontline communities and describes a new methane mapping tool available on EDF's website that characterizes these impacts.

I. Colorado's LDAR program indicates that frequent surveys, including at low producing wells, provide significant benefits and are cost-effective.

EPA's Reconsideration Proposal would substantially weaken the LDAR requirements in the 2016 New Source Performance Standards ("NSPS") by reducing inspection frequency at "low-producing wells" to biennial monitoring (and requesting comment on exempting these sources entirely) and decreasing the inspection frequency for non-low producing wells to annual

monitoring. Since first adopting LDAR requirements in 2014, Colorado has twice strengthened them by increasing the inspection frequency for a suite of well sites with low production. First, in November 2017, the Colorado Air Quality Control Commission ("AQCC") increased the minimum inspection frequency for well sites based on a tiered schedule correlated to potential emissions. Then, in December 2019, after the close of the public comment period on EPA's Reconsideration Proposal, the AQCC further strengthened its LDAR rules to require at least semi-annual inspections for all well sites except for those with actual uncontrolled volatile organic compound ("VOC") emissions less than two tons per year ("tpy"); more frequent inspections, either quarterly or monthly, are required for larger well sites. As a result, semi-annual or more frequent monitoring is now required at many new and existing lower-production facilities in the state.[1]

Further, a new study continues to show that more frequent LDAR surveys are important to maintain the benefits of emissions reductions.[2] This study assessed the effectiveness of LDAR with repeat optical gas imaging ("OGI") surveys at Alberta natural gas facilities. After one survey, total methane emissions were reduced by 44 percent, demonstrating the effectiveness of LDAR for mitigating emissions. Over 90 percent of detected leaks were effectively repaired by the second survey, but fugitive emissions only decreased 22 percent due to the development of new leaks. Consequently, LDAR is highly effective at finding and fixing individual leaks, but repeat, frequent surveys are necessary to maintain low emissions.[3]

A. Colorado Strengthens its LDAR Rules

In 2014, the AQCC adopted LDAR requirements for well production facilities and natural gas compressor stations,[4] citing evidence that "leak frequencies decrease" when LDAR programs are implemented.[5] These rules, described in Table 1 below, set forth a tiered LDAR program where inspection frequency is tied to the actual uncontrolled VOC emissions from the largest storage tank at a well site; the greater the actual VOC emissions, the more frequent the

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[1] *See* Colorado Dep't of Health and the Environment, Economic Impact Analysis, Table 22 (Nov. 5, 2019), Attachment J (semi-annual or more frequent monitoring is now required at 3,103 of the 5,779 well production facilities in the state that have VOC emissions of less than 12 tons per year from the largest onsite storage tank).

[2] Ravikumar, et al., *Repeated Leak Detection and Repair Surveys Reduce Methane Emissions Over Scale of Years*, 15:3 Envtl. Research Letters (Feb. 26, 2020), Attachment A.

[3] However, emission reductions were greater for vented sources (47 percent) than fugitive sources (22 percent), especially for tank-related sources, which may be due to operators identifying malfunctions or design issues causing anomalously high vented conditions. Therefore, EPA underestimates the benefits of LDAR surveys by failing to account for the reduction in vented emissions.

[4] Regulation Number 7, Control of Ozone via Ozone Precursors and Control of Hydrocarbons via Oil and Gas Emissions, 5 Colo. Code Regs. § 1001-9: XVII.F.4. (2014) ("2014 CO LDAR Rule").

[5] Colo. Dep't of Health and the Env't ("CDPHE"), Air Quality Control Div. ("AQCC"), Regulatory Analysis at 29 (Feb. 11, 2014).

inspections.[6] The initial rules required monthly inspections at those sites with tank VOC emissions over 50 tpy, quarterly inspections for sites with tank emissions between twelve and 50 tpy, annual inspections for sites with tank emissions between six tpy and twelve tpy, and a one-time inspection for sites with less than six tpy of VOC emissions.[7]

In 2017 Colorado strengthened its LDAR rules for those well sites with less than twelve tpy VOC emissions from the largest storage tank onsite and located in the Denver metropolitan ozone nonattainment area. Specifically, for this class of well sites, Colorado increased the minimum inspection frequency to annual for those well sites with between one and six tpy of VOCs from tanks and instituted a baseline semi-annual inspection requirement for well sites with six or more tpy of VOC emissions.[8] The state retained the more frequent inspection requirements, either quarterly or monthly, as state-only requirements for those well sites in the highest tier of emissions (i.e. greater than 20 tpy for well sites with hydrocarbon storage tanks and 50 tpy for those without).[9]

Adopted in April 2019, Colorado Senate Bill 19-181 required the AQCC to review its rules for all well sites and specifically consider increasing the well production facility LDAR inspection frequency to a minimum of semi-annual,[10] noting that "more site visits results in the identification and repair of more leaks."[11] Pursuant to this mandate, the AQCC recently strengthened its regulations by increasing the inspection frequency for well sites emitting between two and twelve tpy of VOCs from tanks to semi-annual.[12] The AQCC retained the more frequent inspections, either quarterly or monthly,[13] for well sites with tank emissions greater than twelve tpy, and the annual inspection requirement for well sites with tank emissions between one and two tpy of VOCs located in the nonattainment area.[14]

The state also adopted a wholly new requirement for more frequent inspections at well sites located near homes. Specifically, operators must inspect well sites located within 1,000 feet of an occupied area quarterly, rather than semi-annually, if VOC emissions are greater than two,

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[6] 2014 CO LDAR Rule at XVII.F.4.c. If a well site does not have tanks, the inspection frequency is tiered to the "controlled actual VOC emissions from all permanent equipment." *Id.*
[7] *Id.* at tbl.4.
[8] Regulation Number 7, Control of Ozone via Ozone Precursors and Control of Hydrocarbons via Oil and Gas Emissions, 5 Colo. Code Regs. § 1001-9: XVII.F.4.c. Table 4 (2017) ("2017 CO LDAR Rule").
[9] *Id.*
[10] Protect Public Welfare Oil and Gas Operations, ch.120, sec. 3 §§ 25-7-109(10)(b)(I)(A), 2019 Colo. Sess. Laws 503 ("Colorado Senate Bill 19-181").
[11] Colo. Dep't of Public Health and the Env't, Regulatory Analysis at 10 (Dec. 5, 2019), Attachment B.
[12] Regulation Number 7, Control of Ozone via Ozone Precursors and Control of Hydrocarbons via Oil and Gas Emissions, 5 Colo. Code Regs. § 1001-9: II.E.4.d. Table 3 (2019) ("2019 CO LDAR Rule"), Attachment C.
[13] *Id.* at tbl.3.
[14] *Id.* at I.L.2.a.

but less than twelve tpy.[15] Operators must conduct monthly inspections at well sites with greater than twelve tpy of VOC emissions.[16]

Table 1. Progression of Colorado's LDAR frequency thresholds.

2014 Rule		
VOC Emission Threshold (tpy)		**Inspection Frequency**
No storage tanks present (facility-wide emissions)	*Storage tanks present (highest emitting tank)*	
> 0 and < 6	> 0 and < 6	one-time
≥ 6 and ≤ 12	≥ 6 and ≤ 12	annually
> 12 and ≤ 20	> 12 and ≤ 50	quarterly
> 20	> 50	monthly
2017 Rule		
VOC Emission Threshold (tpy)		**Inspection Frequency**
No storage tanks present (facility-wide emissions)	*Storage tanks present (highest emitting tank)*	
> 0 and < 6	> 0 and < 6	one-time
> 1 and < 6 (within Denver NAA)	> 1 and < 6 (within Denver NAA)	annually
≥ 6 and ≤ 12	≥ 6 and ≤ 12	annually
≥ 6 and ≤ 12 (within Denver NAA)	≥ 6 and ≤ 12 (within Denver NAA)	semi-annually
> 12 and ≤ 20	> 12 and ≤ 50	quarterly
> 20	> 50	monthly
2019 Rule[17]		
VOC Emission Threshold (rolling twelve-month tpy)		**Inspection Frequency**
No storage tanks present (facility-wide emissions)	*Storage tanks present (highest emitting tank)*	
> 0 and < 2	> 0 and < 2	one-time
> 1 and < 2 (within Denver NAA)	> 1 and < 2 (within Denver NAA)	annually
≥ 2 and ≤ 12	≥ 2 and ≤ 12	semi-annually
> 2 and < 12, located within 1,000 feet of an occupied area	> 2 and < 12, located within 1,000 feet of an occupied area	quarterly
> 12 and ≤ 20	> 12 and ≤ 50	quarterly
> 12, located within 1,000 feet of an occupied area	> 12, located within 1,000 feet of an occupied area	monthly
> 20	> 50	monthly

[15] *Id.* at tbl.3.
[16] *Id.*
[17] 2019 CO LDAR Rule Table 3.II.E.4.e.

B. Cost-Benefit Analysis for AQCC LDAR Rules

i. AQCC's Estimate of Costs and Benefits

The AQCC determined that increasing the inspection frequency to semi-annual for those well sites with tank emissions between two and 12 tpy was cost effective.[18] In particular, the AQCC estimated the cost of conducting semi-annual ongoing instrument based inspections at affected well production facilities to be approximately $1,340/ton of VOC and $742/ton of methane/ethane, based on net cost (including gas savings) and allocating all costs of control to each pollutant.[19] In comparison, in the Reconsideration Proposal, EPA estimated under its single pollutant approach, inclusive of gas savings, that semi-annual OGI monitoring would cost $965/ton of methane reduced at non-low production sites and $1,396/ton of methane at low production sites, while costing $3,473/ton of VOC reduced at non-low production sites and $5,023/ton of VOC at low production sites.[20] Notably, Colorado's cost-per-ton estimates for semi-annual monitoring are lower than the cost-per-ton estimates (including gas savings) of EPA's proposed changes to monitoring frequency: EPA estimates annual monitoring at non-low production sites will cost $781/ton of methane reduced and $2,810/ton of VOC reduced, and that biennial monitoring at low production sites will cost $906/ton of methane reduced and $3,259/ton of VOC reduced.[21]

Other analysis submitted as part of the Colorado rulemaking record suggests these numbers are conservative. For instance, WZI, Inc.,[22] an expert engaged by EDF, concluded that Colorado's estimate did not reflect significant decreases in LDAR costs since 2014, noting that "[t]he cost of LDAR has fallen by about 30% since it was originally required in Colorado due to lower initial costs of equipment, availability of rental equipment and training programs, and general lack of inflation in oilfield services."[23]

In sum, Colorado's experience underscores that frequent LDAR surveys at lower production well sites is necessary and important for securing additional pollution reductions and that frequent surveys are both feasible and cost effective. Indeed, Colorado has moved forward with *strengthening* monitoring requirements at both new and existing facilities, in sharp contrast to EPA's proposal to weaken requirements currently in place. In particular, Colorado's recent estimates of the cost of methane and VOC abatement suggest that EPA has significantly overestimated the cost of monitoring.

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[18] Colo. Air Quality Control Comm'n, Economic Impact Analysis for Regulation 7 (Nov. 5, 2019), Attachment D.
[19] *Id*. at 25.
[20] Envtl. Prot. Agency, *Background Technical Support Document for the Proposed Reconsideration of the New Source Performance Standards 40 CFR Part 60, subpart OOOOa*, at 32 (Sept. 2018).
[21] *Id.* 30–31.
[22] EDF, Rebuttal to Comments for Rulemaking on AQCC Proposed Revisions to Regulations Numbers 3 & 7, December 16-19, 2019 Hearing, Expert Report of Mary Jane Wilson, President of WZI Inc., Exhibit 001, Attachment E.
[23] *Id*. at 3–4.

II. Analysis submitted by API purporting to assess the impacts of EPA's failure to regulate existing sources is deeply flawed and cannot be relied upon by EPA.

As detailed in previous comments submitted by the undersigned organizations,[24] as a legal matter, EPA cannot decline to regulate existing sources based on a faulty conclusion that such standards would not result in significant emission reductions. But even if it could, reliance on the analysis put forward in API's November 2019 comments would be arbitrary, capricious, and unlawful. Importantly, as commenters have discussed in past comments, to the extent EPA seeks to rely on new data or analysis as a basis for action taken in a final rule, the agency must first make that information available for public comment as part of a proposal under section 307 of the Clean Air Act.[25]

Furthermore, API's analysis is deeply substantively flawed. API's comments assert that "[a]n existing source rule would provide negligible environmental benefit,"[26] but API's analysis does not support that conclusion because it does not even attempt to account for the substantial emission reductions an existing source rule would deliver outside of the production segment. Moreover, even with respect to its analysis of the production segment, API uses a number of deeply flawed assumptions that result in a dramatic underestimation of emissions reductions possible from an existing source rule.

A. API's model ignores the substantial benefits of an existing source rule applicable to sources outside of the production segment.

API's model only considers methane emissions from oil and gas well sites themselves (i.e., those from pneumatic controllers, pneumatic pumps, storage tanks, and fugitive emission sources at well sites) and fails to consider any emissions from equipment located outside of well sites, such as gathering and boosting equipment, processing plants, or the transmission and storage segments, all of which are currently regulated under EPA's 2016 NSPS for the oil and gas sector. This failure to accurately capture all sources in the oil and gas industry where emissions could be reduced by 111(d) existing source regulations results in a substantial underestimation of emissions and potential reductions in API's analysis.

EDF modeled emission impacts and possible reductions using its Methane Policy Analyzer,[27] demonstrating that existing sources outside of the production segment have

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[24] *Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources*, EPA-HQ-OAR-2017-0757-2134 (Nov. 25, 2019) ("Joint Environmental Comments"); *see also Proposed Oil and Natural Gas Sector: Emission Standards for New, Reconstructed and Modified Sources Reconsideration*, EPA-HQ-OAR-2017-0483-2041 (Dec. 17, 2018) ("Reconsideration Comments").

[25] *See* 42 U.S.C. § 7607(d)(3)(A); Joint Environmental Comments at 72–73; Reconsideration Comments at 55–65.

[26] Am. Petroleum Inst., *Oil and Natural Gas Sector: Emissions Standards for New, Reconstructed, and Modified Sources Reconsideration; Proposed Rule*, EPA-HQ-OAR-2017-0757-2090 (Nov. 25, 2019) ("API Comments").

[27] For a full description of the Methane Policy Analyzer, *see* Joint Environmental Comments, Appendix D, McVay, Hull, Roberts, *Assessment of Harm to the Public from Foregoing Methane*

significant emissions that could be reduced through an existing source rule. EDF's results are produced in Table 2. In 2025, an existing source rule could prevent 1.1 million tons of methane emissions from sources outside of the production segment, equivalent to removing more than 20 million cars from the road,[28] over 179,000 tons of VOC emissions, and over 6,600 tons of hazardous air pollutant ("HAP") emissions. Cumulatively, between 2020 and 2030, an existing source standard for sources outside of the production segment could prevent over 12 million tpy of methane emissions, nearly 2 million tpy of VOC emissions, and nearly 74,000 tons of HAP emissions (Table 3). Even if EPA finalizes its proposal to rescind the 2016 NSPS's requirements for sources in the transmission and storage segment—which would be wholly unlawful[29]—the potential for pollution abatement through an existing source rule would be very large. The cumulative emission reductions achievable from sources outside of the production *and* transmission and storage segments[30] would be over 6.5 million tons of methane emissions, over 1.8 million tons of VOC emissions, and 69,000 tons of HAP emissions (Table 4).

Table 2. Annual methane, VOC, and HAP emissions (tpy) and potential reductions from an existing source rule applicable outside the production segment.

Year	Methane Emissions	VOC Emissions	HAP Emissions	Methane potential reductions from a 111(d) rule	VOC potential reductions from a 111(d) rule	HAP potential reductions from a 111(d) rule
2020	4,469,470	771,414	28,717	1,305,806	216,636	8,052
2021	4,356,988	747,319	27,813	1,268,006	208,879	7,761
2022	4,252,160	724,142	26,943	1,233,631	201,460	7,483
2023	4,131,008	699,347	26,015	1,192,859	193,674	7,192
2024	4,013,186	675,910	25,138	1,152,213	186,180	6,913
2025	3,901,515	653,682	24,306	1,113,968	179,047	6,646
2026	3,798,840	633,017	23,532	1,079,180	172,429	6,399
2027	3,701,564	613,353	22,796	1,046,470	166,153	6,164
2028	3,608,077	594,656	22,096	1,015,155	160,205	5,942
2029	3,522,503	577,129	21,440	986,808	154,625	5,733
2030	3,444,172	560,735	20,826	961,371	149,416	5,538

Guidelines for Existing Sources at 4 (Nov. 21, 2019), *available at* https://www.regulations.gov/document?D=EPA-HQ-OAR-2017-0757-2134.

[28] Utilizing a Global Warming Potential for methane of 87 times carbon dioxide.

[29] *See, e.g.*, Joint Environmental Comments at 18-43.

[30] As discussed extensively in prior comments, the "significance" of emissions from all new and existing sources in the production, processing, transmission, and storage segments must be evaluated together, but in any event, the emissions from each segment alone are significant and must be regulated. *See* Joint Environmental Comments at 93-98. This analysis further underscores that each segment has significant emissions, with meaningful opportunity for reductions.

Table 3. Cumulative methane, VOC, and HAP emissions (tons) and potential cumulative reductions from an existing source rule applicable outside of the production segment.

Year	Methane Emissions	VOC Emissions	HAP Emissions	Methane potential reductions from a 111(d) rule	VOC potential reductions from a 111(d) rule	HAP potential reductions from a 111(d) rule
2020	4,469,470	771,414	28,717	1,305,806	216,636	8,052
2021	8,826,458	1,518,732	56,530	2,573,812	425,514	15,813
2022	13,078,617	2,242,874	83,474	3,807,443	626,974	23,297
2023	17,209,626	2,942,221	109,488	5,000,302	820,648	30,489
2024	21,222,812	3,618,131	134,626	6,152,515	1,006,828	37,401
2025	25,124,327	4,271,814	158,932	7,266,483	1,185,876	44,048
2026	28,923,167	4,904,830	182,464	8,345,663	1,358,304	50,446
2027	32,624,731	5,518,183	205,260	9,392,133	1,524,458	56,611
2028	36,232,807	6,112,839	227,357	10,407,288	1,684,662	62,553
2029	39,755,310	6,689,968	248,797	11,394,096	1,839,287	68,287
2030	43,199,482	7,250,703	269,623	12,355,468	1,988,703	73,825

Table 4. Annual methane, VOC, and HAP emissions (tpy) and potential reductions from an existing source rule applicable outside the production and transmission and storage segments.

Year	Methane Emissions	VOC Emissions	HAP Emissions	Methane potential reductions from a 111(d) rule	VOC potential reductions from a 111(d) rule	HAP potential reductions from a 111(d) rule
2020	2,542,657	706,782	26,698	721,080	200,439	7,571
2021	2,458,892	683,498	25,818	694,271	192,986	7,290
2022	2,377,963	661,002	24,969	668,430	185,803	7,019
2023	2,292,388	637,215	24,070	641,835	178,411	6,739
2024	2,211,887	614,838	23,225	616,389	171,338	6,472
2025	2,135,548	593,618	22,423	592,123	164,592	6,217
2026	2,064,468	573,860	21,677	569,527	158,311	5,980
2027	1,996,802	555,051	20,966	548,073	152,348	5,755
2028	1,932,594	537,203	20,292	527,769	146,704	5,542
2029	1,872,191	520,413	19,658	508,611	141,379	5,340
2030	1,815,529	504,663	19,063	490,613	136,376	5,151

As discussed extensively in prior comments,[31] methane is co-emitted with significant amounts of other harmful air pollutants, including HAPs and VOCs. HAPs can include benzene and formaldehyde, known human carcinogens, and VOCs react in the atmosphere to form ground-level ozone (the primary component of smog) and fine particulate matter. Human exposure to ozone and fine particulates can cause a number of serious health problems, including

[31] *See* Reconsideration Comments at 9–11, 135–41; Joint Environmental Comments at 70–71.

premature death.[32] These impacts are acutely felt by children,[33] the elderly, and low-income communities.[34] EPA's failure to properly assess these impacts is discussed in more detail below in Section IV.

As reflected in the various scenarios captured in Tables 2, 3, and 4, API's failure to consider sources outside of the production segment improperly excludes substantial emissions reduction benefits that could be delivered by a 111(d) existing source rule.

B. API's analysis of the benefits of an existing source rule focused on the production sector is based on unsupported and flawed assumptions.

API's analysis purports to assess the benefits of an existing source rule applicable to the production segment, but there too, the analysis is based on flawed assumptions designed to systematically (and dramatically) underestimate the benefits of an existing source rule. These comments focus on flaws related to API's (1) assessment of baseline emissions and projected declines in those emissions absent existing source regulations, and (2) assumptions regarding the design, coverage, and implementation of existing source standards. EDF also commissioned the consulting firm MJ Bradley & Associates ("MJB") to review API's analysis, and additional detail on the issues below can be found in the MJB memorandum included with these comments as Attachment F.

i. API's assessment of baseline emissions and projected declines is flawed.

There are a number of ways API's analysis understates emissions from existing sources in the production segment and then further seeks to minimize these emissions by using aggressive assumptions about the turnover and replacement of those existing sources with new sources. Among other deficiencies, API's analysis disregards emissions from super-emitting sites and ignores the role of shut-in wells, and further compounds these errors by assuming rapid turnover of existing sources over time. Collectively, these assumptions create the false impression that, absent standards, existing source emissions are small and declining.

Exclusion of super-emitters. API's analysis improperly removes all emissions data points it terms "extreme outliers" because the data "could be due to reporting errors rather than real

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[32] Reconsideration Comments at 9.

[33] The Children's Health Office at EPA has concluded that "[c]hildren suffer a disproportionate burden of ozone-related health impacts due to critical developmental periods of lung growth in childhood and adolescence that can result in permanent disability." Letter from Sheela Sathyanarayana, MD MPH, Chair, Children's Health Prot. Advisory Comm., to Christopher Frey, PhD, CASAC Review of the Health Risk and Exposure Assessment for Ozone and Policy Assessment for the Review of the Ozone NAAQS: Second External Review Drafts (May 19, 2014), *available at* http://yosemite.epa.gov/sab/sabproduct.nsf/7F79D27B503CB28385257CDE00546CB3/$File/CHPAC+May+2014+Letter+&+Attached+2007+Letters.pdf.

[34] Joint Environmental Comments at 70.

variability in emissions."[35] This treatment ignores the scientific literature on super-emitters, or sites with extremely high emissions. API's exclusion of these *industry-reported* data points very likely results in the complete exclusion of super-emitters from its model. As summarized in prior comments, data indicates that fifty percent of methane emissions result from super-emitters and low production super emitters emit five times more methane than low production sites that are not super-emitters, indicating improperly operating equipment.[36]

A 2017 study in the Barnett Shale confirms the disproportionate contribution to methane emissions from oil and gas super emitters by conducting measurements during multiple site visits and using an "aggregation routine" to scale the results across the shale field.[37] This study found that the top one percent of site emitters were responsible for 44 percent of methane emissions and the top ten percent were responsible for 80 percent of methane emissions.[38] Another study, which collected data on point source emissions in California, confirmed the role of super emitters: ten percent of oil and gas sources in the state contributed more than 60 percent of total methane emissions from the source category.[39]

Most recently, data released from EDF's PermianMAP project underscores the scale of methane emissions and the contribution to overall emissions from high emitting sites.[40] Data was collected between October 2019 and March 2020 across a 10,000 square-kilometer study area containing nearly 11,000 wells and responsible for 40% of the Permian basin's production, using ground-based mobile sensors, fixed-wing aircraft and helicopters.[41] The data shows methane escaping from oil and gas operations at nearly three times the equivalent national average natural gas production-normalized upstream loss rate reported in EPA's Draft 2020 Greenhouse Gas Inventory. The 3.5% loss rate estimated in the study area represents 1.4 million metric tons of lost gas each year, enough to meet the annual natural gas needs of every home in Dallas and Houston combined. Some small areas with approximately a dozen wells had methane emission rates equivalent to about 1000 average wells. Furthermore, ground-based measurements revealed an existing single, low production oil well with methane emissions of 160 kg/hour, or .18 tons/hour. It would only take *10 hours* of emitting at that rate to surpass the 1.8 tons per *year* of methane emissions at a low-producing oil well assumed by EPA in the 2018 Reconsideration

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[35] Earth System Sciences, LLC, Am. Petroleum Inst., *Methane Emissions from Regulated Onshore Productions Sources: Evaluating the Impact of Existing Federal and State Regulations* at 11 (Oct. 2019) ("API Attachment A").
[36] Reconsideration Comments at 102–04, Appendix G.
[37] Zavala-Araiza et al., *Super-Emitters in Natural Gas Infrastructure Are Caused by Abnormal Process Conditions*, 8 NATURE COMMC'NS. 14,012 (Jan. 16, 2017), *available at* https://www.nature.com/articles/ncomms14012.pdf.
[38] *Id.* at 2, 4.
[39] Riley M. Duren, et al., *California's Methane Super-Emitters*, 575 NATURE 180, 182 (Nov. 7, 2019), Attachment G.
[40] EDF, PermianMAP, http://www.permianmap.org/.
[41] EDF, *Methodology: Permian Methane Analysis Project (PermianMAP)*, https://www.permianmap.org/static/permianmap-methodology-c40819a5466c74447e941b6606bf6475.pdf, Attachment I.

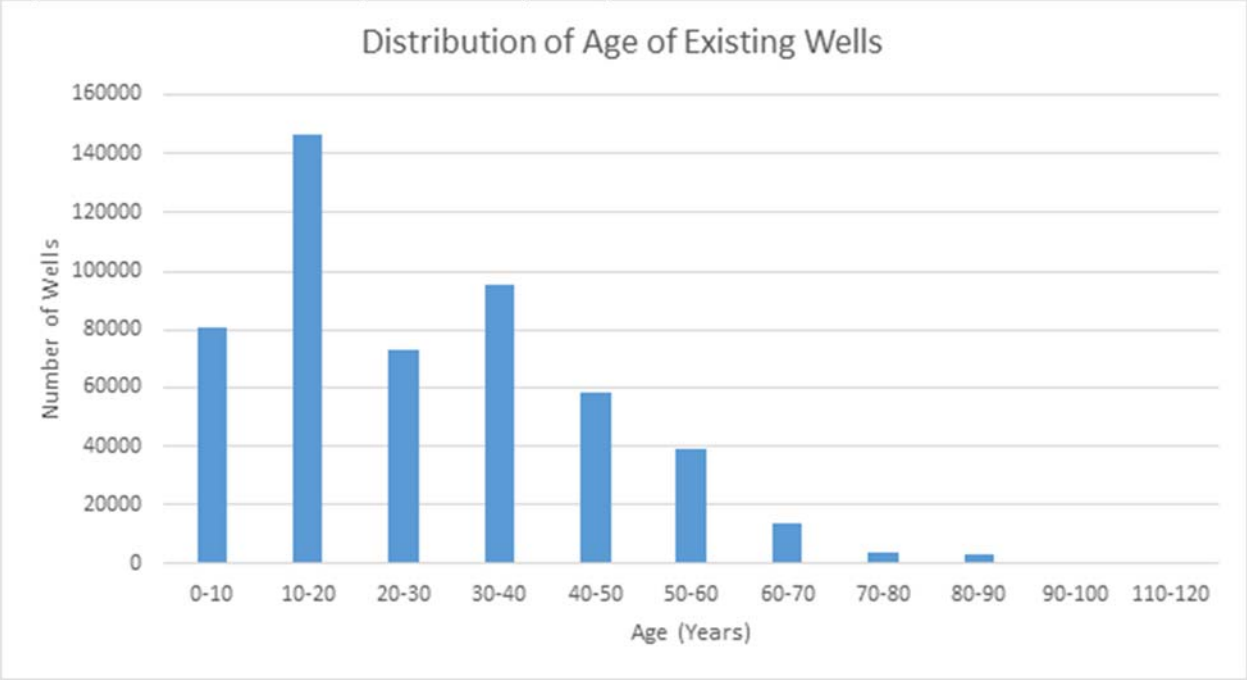
Proposal. New data from the PermianMAP project will made available on a periodic basis as researchers continue to measure emissions over the course of a year.

API's attempt to explain away super-emitter data as "reporting errors" is not only baseless, but directly conflicts with the best and most recent on-the-ground evidence.

High rates of well shut-ins. Alongside its failure to account for super-emitters, API projects substantial declines in baseline emissions absent any existing source standards based largely on its assumptions about future production (and coverage of new source standards) and the shut-in rate of existing wells.[42] API's analysis ignores both the importance of these assumptions in driving its projected declines in baseline emissions and the uncertainties (and inaccuracies) surrounding them.[43] For example, API's assumption that "a large fraction" of the currently producing wells will become shut-in wells within 25 years is erroneous. As Figure 1 illustrates, a number of existing, producing marginal wells are significantly older than 25 years, including over 200,000 wells in operation longer than 30 years, and nearly 60,000 in operation for over 50 years.[44]

[42] API states "[t]he key result here is that . . . the fraction of wells and production covered by new source requirements increases significantly over time." API Comments, Attachment A at 16.
[43] For instance, API selects one future production scenario from the Energy Information Administration ("EIA"), API Comments, Attachment A at 12, though EIA's future gas production predictions range between 80 and 150 trillion cubic feet annually, depending on the assumptions used. U.S. Energy Information Administration, U.S. Dep't of Energy, Annual Energy Outlook 2018 at 61, https://www.eia.gov/outlooks/archive/aeo18/pdf/AEO2018.pdf.
[44] In February 2020, EDF used data from its Methane Policy Analyzer to separate currently low producing wells from non-low producing wells. Those low producing wells were then separated into age groups by decade.

Figure 1. Distribution of age of existing marginal wells.



Exclusion of emissions from shut-in wells. API further compounds the emissions underestimation by assuming that the large number of wells its model predicts will shut-in (~400,000) are not associated with *any* emissions. Unless each shut-in well is properly plugged, this assumption is unreasonable. A recent study showed that, among shut-in wells, unplugged wells emit methane at a rate over 5,000 times higher than those that are properly plugged.[45] Another study from Pennsylvania estimates that emissions from abandoned wells account for between four and seven percent of the total anthropogenic methane emissions from the entire state.[46] The significant potential emissions from wells that are shut-in but not properly plugged undermine API's assumption of no emissions *at all* from shut-in wells.

ii. API's artificial constraints on the timing and scope of existing source standards inaccurately minimize the benefits of an existing source rule.

Alongside these flawed assumptions about baseline emissions from existing sources absent regulation, API makes a series of assumptions about the timing, scope, and overlaps of potential existing source standards that further inaccurately (and dramatically) downplay the benefits of these standards. In particular, API assumes that: (1) existing source standards will not take effect until 2028; (2) when effective, the standards will not apply to key sources, like lower

[45] *See* Townsend-Small et al., *Emissions of Coalbed and Natural Gas Methane from Abandoned Oil and Gas Wells in the United States*, 43 GEOPHYSICAL RESEARCH LETTERS 2283, 2285 (Mar. 11, 2016) (finding plugged wells emitted 0.002 g CH_4/h and unplugged wells emitted 10.02 g CH_4/h).

[46] Kang, et al., *Direct Measurements of Methane Emissions from Abandoned Oil and Gas Wells in Pennsylvania*, 111:51 PNAS 18173, 18176 (Dec. 23, 2014).

production wells; and (3) the standards will not apply in certain (undefined) states, which API claims will have equivalent standards.

Delayed adoption. API assumes unrealistically long timelines for adoption and implementation of an existing source rule, not counting *any* emissions reductions from the rule until 2028.[47] In creating this timeline, API has made a number of unfounded assumptions including that (1) states will not submit plans before the deadline (three years from rule finalization),[48] (2) EPA will take the maximum amount of time necessary to review the plans (eighteen months from plan submission),[49] (3) no state will have a compliant plan and a federal plan will be needed for all states, (4) it will take EPA two years to finalize federal plans,[50] and (5) EPA will give states two years to comply with federal plans.[51] Each of these assumptions is at best flawed, and at worst downright bizarre. First, API disregards the fact that, under the current section 111(d) implementing regulations, EPA has full authority to require stricter timelines than those that apply by default,[52] and has a strong incentive to do so with regard to emission guidelines that concern climate pollutants like methane.

Points three through five are particularly irrational: API provides no basis at all its assumption that *zero states* will submit approvable plans. It further envisions that, during the three years that states spend either developing unapprovable plans or simply doing nothing, EPA has no capacity to begin the process of developing FIPs. This simply makes no sense. If, in fact, *every state* to which these rules apply truly could not develop an approvable plan, it is unimaginable that those states would not communicate this fact to EPA at some point within the three-year plan development window and allow the agency to begin work on FIPs.

API has conjured this imaginary timeline not based on past or likely future experience, but merely to suit the needs of its argument that federal existing source regulations will not achieve significant emission reductions from oil and gas sources. In fact, EPA can and must ensure that an existing source rule achieves substantial and important near-term benefits, even if API's otherwise flawed assumptions concerning existing source turnover were correct (which they are not).

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[47] API Attachment A at 4, 14–15.
[48] *Id.* at 16. This is based on the *maximum* three-year deadline codified in 40 C.F.R. § 60.23a(a)(1), which requires state plan submissions "within three years after the notice of the availability of a final emission guideline."
[49] API Attachment A at 16. EPA permits itself six months after the state plan due date for a "completeness" review, 40 C.F.R. § 60.27a(g), followed by twelve months to approve and/or disprove state plans, *id.* § 60.27a(b). API assumes that EPA will not conduct its compliance review until it has completed its completeness review.
[50] EPA's regulations provide for development of a federal plan within two years after either a state's failure to submit a state plan or EPA's disproval of a state plan. *Id.* § 60.27a(c).
[51] There is no citation or justification for this assumption.
[52] 40 C.F.R. § 60.20a(a)(1) ("Each emission guideline promulgated under this part is subject to the requirements of this subpart, except that each emission guideline may include specific provisions in addition to or that supersede requirements of this subpart. Each emission guideline must identify explicitly any provision of this subpart that is superseded.").

Limited coverage. API further understates the benefits of an existing source rule by assuming that such a rule would not include standards for LDAR at low producing wells—thereby likely excluding the majority of the remaining existing sources (although it is not clear in API's model the number of sources to which the exemption is assumed to apply).[53] API bases this assumption on the 2016 control techniques guidelines ("CTGs"), which provisionally concluded that "[a]t this time [in 2016], this CTG does not include a [reasonably available control technology ("RACT")] recommendation for well sites with an average production of less than 15 barrel equivalents per well per day." API notably declines to mention the fact that, in the CTG, EPA "encourage[d] air agencies to consider site-specific data from these [low production] sources in their RACT analyses."[54] In any event, there is no reason to assume that any exemption for low production sites would apply here. The purpose of the CTGs is to assist states with ozone nonattainment status to come into compliance with the national ambient air quality standards for ozone, not to reduce greenhouse gas emissions from oil and gas sources. Further, as addressed in prior comments,[55] studies indicate that low producing wells have significant emissions and recent studies confirm this conclusion.[56] It would be irrational for EPA to exclude these wells from *any* LDAR requirements to control methane, whether at new or existing sources.

Overlap with state standards. Finally, it appears that API assumes that an existing source standard will not have benefits in certain, undefined states. If API broadly assumed that state programs are equivalent to the federal standards (as EPA did in its recent reconsideration proposal), this would suggest that existing source standards would not have benefits in those states. This is plainly inaccurate: even where states have their own standards to control oil and gas emissions, those programs are often limited in scope, and do not necessarily require the same level of emission reduction as EPA must ensure under section 111. To give one example, the LDAR program in Texas only applies to wells with very high uncontrolled emissions, covering between 2.2 and 11 percent of wells.[57] Combined, the state regulations that EPA has identified as having "equivalent" fugitive emission programs cover only 34 percent of the total wells covered by the current federal NSPS.

Taken together, API's assumptions about the delayed implementation of existing source standards, the limited scope of such a standard, and the overlap that existing source standards would have with other state regulations result in a wholly inaccurate assessment of the emission reductions an existing source standard could deliver. Any effort by EPA to rely on API's projections would thus be arbitrary and capricious.

III. IPAA's comments downplay the significant emissions associated with low production wells.

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[53] According to Enervus data, described *infra* n. 68, 82% of existing wells produce on average less than 15 barrel equivalents per day, based on the most recent 12 months of production.
[54] *Control Techniques Guidelines for the Oil and Natural Gas Industry* at 9–38, EPA – OAR, EPA-453/B-16-001 (Oct. 2016).
[55] Reconsideration Comments at 94–108.
[56] *Id.* at Appendix H.
[57] *Id.* at 44–55.

In comments on the Methane Rescission Proposal,[58] IPAA claims that emissions from low production wells are not significant. This is not true; new and existing low production wells account for over a million tons of methane emissions each year through 2030 that could be mitigated with federal standards. As detailed in Table 5 below, EDF used its Methane Policy Analyzer to derive the methane emissions reductions at low production wells under the 2016 NSPS and under a potential 111(d) rule that mirrors the 2016 NSPS.

Table 5. Emissions reductions attributable to 2016 NSPS standards for new low production wells and potential emissions reductions attributable to 111(d) standards for existing low production wells

Year	Emissions Reductions at New Low Production Wells Under 2016 NSPS (tpy CH4)	Potential Emissions Reductions at Existing Low Production Wells under 111(d) Rule that Mirrors 2016 NSPS (tpy CH4)
2020	739,990	1,215,072
2021	878,355	1,155,142
2022	1,003,642	1,099,335
2023	1,109,404	1,043,549
2024	1,218,935	989,626
2025	1,330,591	939,154
2026	1,436,410	891,990
2027	1,514,857	847,238
2028	1,582,789	805,484
2029	1,632,768	767,185
2030	1,675,777	731,897

Further, a new study continues to show that low production wells have emissions similar to non-low production wells.[59] The study examined sites across a range of production rates and found that average emissions as a percentage of gas production decreased with increasing production, and *absolute emissions of low production and non-low production wells are of similar magnitude*. IPAA's assertions to the contrary are thus incorrect.

IV. EPA's proposed methane rollbacks will have significant pollution impacts in frontline communities across the country and disproportionate impacts on vulnerable groups.

EPA's proposals to eliminate or weaken key provisions of the 2016 NSPS are arbitrary and capricious because EPA also fails to meaningfully assess the number, demographics characteristics, and geographic distribution of Americans living in close proximity to existing oil

[58] Indep. Petroleum Ass'n of Am., *Oil and Natural Gas Sector: Emissions Standards for New, Reconstructed, and Modified Sources Reconsideration; Proposed Rule*, EPA-HQ-OAR-2017-0757-2077 (Nov. 25, 2019) ("IPAA Comments").
[59] Ravikumar, et al., Attachment A.

and gas wells. Further, EPA fails to properly consider a number of important factors relating to its proposals, including a failure to: (1) calculate the foregone emissions reductions of methane, VOCs, and HAPs from existing oil and gas sources; (2) to describe and quantify, to the extent possible, the additional health harms faced by those living near wells; or (3) to provide an analysis of emissions increases at the state and local levels resulting from the agency's proposed rollbacks. EDF analyzed these factors, revealing that a substantial number of individuals live near both new and existing oil and gas wells and will face significant health and welfare impacts from EPA's failure to regulate existing source emissions. EDF's analysis further underscores that the proposals would abdicate EPA's mandate to protect human health and the environment, and that the agency's analysis falls far short of the rational decision-making the Clean Air Act requires.

A. Mapping analysis shows that EPA's proposals would place 9.5 million people at risk from increased air pollution in their communities from oil and gas wells.

The reduction of LDAR frequency in EPA's Reconsideration Proposal will increase air pollution and have a negative impact on human health. As the Reconsideration Proposal itself admits, "the forgone VOC emission reductions may degrade air quality and adversely affect health and welfare effects associated with exposure to ozone, PM2.5, and HAP."[60] In declining to quantify these impacts, EPA asserts an inability to "estimate forgone health benefits estimates for this rule due to the differences in the locations of oil and natural gas emissions points relative to existing information and the highly localized nature of air quality responses associated with HAP and VOC reductions."[61] This claim is erroneous: EPA's own scientists have developed a methodology to quantify and monetize the benefits of VOC emission reductions, specifically including the health impacts resulting from reduced oil and gas air pollution.[62] In the Reconsideration Proposal, EPA arbitrarily ignored this methodology and declined to quantify the forgone benefits that would result from that rule.[63]

Worse still, the Methane Rescission Proposal, which EPA claims would extinguish its current and ongoing obligation to issue an existing source emission guideline for this sector, ignores *all* the emission reductions from existing sources that would be sacrificed under such a rescission—methane, VOCs, and HAPs alike. If EPA finalizes the Methane Rescission Proposal, 3.6 million metric tons of additional—and avoidable—methane emissions, 850,000 metric tons of VOC emissions, and 32,000 metric tons of HAPs will be emitted in 2021.[64] These emissions will drive further climate change and pose significant threats to human health. If, on the other hand, EPA declines to finalize the Methane Proposal and promptly issues an existing source emission guideline under Section 111(d), it can avoid these harmful emissions.

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[60] Reconsideration Proposal at 52,088.

[61] EPA, *Regulatory Impact Analysis for the Proposed Reconsideration of the Oil and Natural Gas Sector Emission Standards for New, Reconstructed, and Modified Sources* at 2-3 (2018) ("2018 RIA").

[62] Reconsideration Comments at 136-38; Fann et al., Assessing Human Health PN2.5 and Ozone Impacts from U.S. Oil and Natural Gas Sector Emissions in 2025, 52 Envt'l Sci. & Tech. 8095 (2018).

[63] *See* Reconsideration Comments at 135-41.

[64] Joint Environmental Comments at 69.

EPA's failure to fully scrutinize the emission impacts of its proposals is arbitrary and capricious, and deprives the public of crucial information relevant to health and the environment. Understanding the urgent need to assess the impacts of EPA's proposals, EDF developed a geographic and quantitative methodology that calculates the number of people living near new and existing oil and gas wells, who will suffer significant harm if EPA finalizes its proposals.[65]

EDF found that approximately 9.5 million people live within a one-half mile radius of an oil or gas well.[66] Of those, over 99 percent live within a one-half mile radius of an existing oil or gas well, each of which is unregulated under the 2016 NSPS but would be subject to a section 111(d) existing source rule. If EPA finalizes its Methane Rescission Proposal, emission from those wells are unlikely to remain abated. Table 6 depicts this information, along with the numbers of vulnerable sub-populations living in close proximity to such wells.[67]

[65] Envtl. Defense Fund, Federal Methane Map Methodology, *available at* http://www.edf.org/sites/default/files/energy/og_map/edf-wells-emissions-methodology.pdf
[66] Envtl. Defense Fund, Oil and Gas Pollution: United States, *available at* https://www.edf.org/federalmethanemap/. Federal and state factsheets with emissions, population, and demographic information are included as Attachment H to these comments.
[67] Attachment H at 1.

Table 6: Impacted communities living within a one-half mile radius of an oil or gas well[68]

Impacted community	Total wells	Wells regulated under current NSPS	Wells not regulated by EPA
Total population[69]	9,465,487	910,788	9,390,326
Children under 5	605,936	60,810	589,423
Adults over 65	1,427,299	121,562	1,403,557
Population below the poverty line	1,420,589	137,837	1,398,860
People of color	2,803,691	429,390	2,776,867

EDF's Federal Methane Map, released in November 2019, is an interactive mapping tool that provides a visual representation of the population living near oil and gas wells and allows individuals to see how their community would be affected by EPA's proposals.[70] In addition to national numbers, the analysis includes a state-by-state breakdown of the number of individuals living within a one-half mile radius of an oil or gas well. These results are also provided at the county level to show the discrete geographic zones where people live in close proximity to oil and gas wells. This visualization underscores the magnitude of people who will be negatively impacted by these rules.

B. The rollback proposals have disproportionate and severe impacts on children and the elderly, people of color, and those living below the poverty line.

As shown in Table 6, the mapping analysis reveals not only that over nine million individuals live in the immediate radius of existing oil or gas wells, but also that this population contains a disproportionate share of vulnerable individuals who will be particularly affected by local air pollution. Nearly 600,000 children under the age of 5 and approximately 1.4 million

[68] Attachment H at 1. In September 2019, EDF used the Enervus database to obtain data for all wells in the United States and then excluded offshore wells and wells without active production during 2018 and 2019. Wells that were drilled or modified after September 18, 2015, are "new" or "modified" wells and are regulated under the NSPS 40 C.F.R., Part 60, Subpart OOOOa regulations. All remaining wells are considered "existing" and are not subject to the NSPS. By identifying all active well sites, EDF was able to identify local communities that are impacted by the air pollution from these well sites. Specifically, using the United States Census Bureau American Community Survey estimates for 2012–2016, EDF was able to estimate the populations living within a one-half-mile radius of the wells using areal apportionment, as described in more detail in prior comments. Reconsideration Comments at Appendix G. EDF used a half-mile radius because recent scientific evidence indicates close proximity to oil and gas development is associated with HAP exposure and other adverse health impacts for local populations. The American Community Survey estimates also provided a demographic background of the populations at the census tract level, enabling assessment of the population of impacted communities by age, poverty status, and race/ethnicity.

[69] The numbers may not sum due to persons living within a one-half-mile radius of both regulated and unregulated wells.

[70] EDF, Federal Methane Map, https://www.edf.org/federalmethanemap/ (last accessed Feb. 1, 2020). The Methane Map incorporates data described *supra* n.68.

adults over the age of 65 live within a one-half mile radius (a range that is particularly associated with detrimental health effects from pollutants) of oil or gas wells that would remain unregulated if EPA finalizes the Methane Rescission Proposal.[71] The Methane Rescission Proposal does not consider these significant numbers. As a result, EPA neglects its duty to protect the health of vulnerable populations from environmental harm.

A similarly disproportionate effect holds for the Methane Rescission Proposal's impact on individuals who have historically suffered from greater exposure to pollutants. EDF's mapping tool shows that 1.4 million individuals living below the poverty line reside within a one-half mile radius of unregulated, existing oil or gas wells.[72] These individuals have fewer economic resources that would allow them to relocate, and less capacity to bear the economic consequences of negative health effects from air pollution. Moreover, nearly 2.8 million individuals of color reside in a half-mile radius of an unregulated, existing oil or gas well.[73] The Reconsideration Proposal likewise fails to consider the significant populations who live in close proximity to new and modified well sites where the proposed changes would result in emissions increases.[74]

Under Executive Order 12,898, EPA is obligated to consider the environmental justice impacts of its actions.[75] EPA has said that it believes "this proposed action is unlikely to have disproportionately high and adverse human health or environmental effects on minority populations, low-income populations, and/or indigenous peoples."[76] EPA's stated belief, however, is not supported by any analysis or data; it is merely a conclusory assertion with no basis in evidentiary fact. As a result, EPA has not adequately assessed the environmental justice impacts of either proposal. These concerns about EPA's omission are substantiated by EDF's new geographic analysis that shows the rollbacks' high impact on minority and low income populations. When an analysis reveals that an action will exacerbate environmental injustices, as shown here, EPA must follow another course of action. Because EPA's proposals would continue subjecting low-income communities and communities of color to unregulated, dangerous local air pollution—as well as the many other reasons discussed herein and in previous comments—EPA must abandon its proposed rollbacks and commit to reducing oil and gas air pollution to the greatest extent possible.

C. The proposals will substantially increase emissions of methane, VOCs, and HAPs.

EDF's analysis found that the millions of people who live near existing oil and gas wells will suffer from a significant and quantifiable increase in emitted pollutants if EPA finalizes these proposed rules. The national numbers from this emissions analysis are striking. In 2025, under a "weak" regulatory scenario in which EPA finalizes both proposed rules, existing oil and gas wells will emit in total over 11 million metric tons of methane, 4.2 million metric tons of VOCs, and 250,000 metric tons of HAPs. By comparison, under a "modest" regulatory scenario,

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[71] Attachment H at 1; *see also* Reconsideration Comments at Appendix G.
[72] Attachment H at 1.
[73] *Id.*
[74] *Id.*
[75] Exec. Order 12,898, 59 Fed. Reg. 7629 (Feb. 11, 1994).
[76] 84 Fed. Reg. at 50,283.

existing oil and gas wells will emit roughly 7.9 million metric tons of methane, 2.1 million metric tons of VOCs, and 140,000 metric tons of HAPs.[77]

For the "modest" regulatory scenario, EPA's OOOO and OOOOa rules remain unchanged, and the emission reductions expected under those programs are applied to new sources. Many states have regulations applicable to new (and sometimes existing) sources, and these are applied where appropriate. In addition, the model includes a federal 111(d) regulation that applies all applicable requirements from OOOO and OOOOa to existing sources. For the "weak" regulatory scenario, EPA's OOOO rule remains in place, but OOOOa is amended in accordance with EPA's 2018 Reconsideration Proposal and 2019 Methane Rescission Proposal, and no federal 111(d) regulation is applied to existing sources. All current state regulations are assumed to still apply.

VOC and HAP emissions are calculated using the aforementioned methane emission inventories with state and source-specific VOC-to-methane and HAP-to-methane ratios applied. These ratios were calculated using emission data from oil and gas production sources from EPA's "Oil and Gas Emissions Estimation Tool Version 2.2."[78] Methane, VOC, and HAP emissions for each source type were aggregated by state. Then, these emissions were compared to calculate a ratio of either VOC-to-methane or HAP-to-methane for emissions from each source category in each state. Once these ratios were calculated, emissions at a national, state, and county level could be calculated. As with the data on individuals living within a half mile of unregulated wells, the emissions were entered into EDF's Federal Methane Map interactive mapping tool.[79] The Map therefore visualizes both the vulnerable populations exposed to increased local air pollution as well as the magnitude of those increases. On the other hand, by abandoning both Proposals and moving forward with an existing source rule, EPA will secure significant emission reductions for these communities.

In sum, EPA's Methane Rescission Proposal means that 9.3 million people living within a half mile of an existing oil or gas well would be exposed to significant emissions of HAPs and VOCs, as would the nearly one million people living near new and modified wells under EPA's Reconsideration Proposal. And because emissions from oil and gas source other than wells also

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[77] To calculate this increase, EDF estimated oil and gas production methane emissions for 2017, and for two different scenarios in 2025, using the Methane Policy Analyzer model. A baseline methane emissions inventory was developed for 2015, using a combination of EPA Greenhouse Gas Reporting Program data and previously published measurement studies, as reported in Alvarez, et al., *Assessment of Methane Emissions from the U.S. Oil and Gas Supply Chain*, 361 SCIENCE 186 (2018), for the alternative inventory (section S1.4). Emissions were projected forward in time for a "No Regulations" scenario using projected energy growth rates from Rystad Energy. Emissions are divided between "new" and "existing" emissions (based on the relevant date for NSPS OOOOa) using a 5% turnover rate for production sources. From this baseline "No Regulations" emissions projection, various regulatory scenarios were modeled. *See* Joint Environmental Comments at Appendix D.

[78] *Available at* ftp://newftp.epa.gov/air/nei/2014/doc/2014v2_supportingdata/nonpoint/.

[79] EDF, Federal Methane Map, http://www.edf.org/sites/default/files/energy/og_map/edf-wells-emissions-methodology.pdf.

affect local communities, EPA's proposals will cause even greater harm than these figures indicate. In particular, children under five and adults over 65 will continue to be exposed to damaging air pollution, preventable increases in respiratory distress, and overall illness. These proposals would force overburdened communities to live with significant air pollution. And they would exacerbate climate change by allowing significant releases methane into the atmosphere to continue unabated. On the other hand, by abandoning both Proposals and moving forward with an existing source rule, EPA will secure significant emission reductions for these communities.

EPA has not offered any adequate evidence to justify the extensive harm that its proposals will cause, nor has it quantified the resulting emission increases despite readily available methodologies for doing so. The agency has thus neglected its mandate under the Clean Air Act to "protect and enhance" air quality and the statute's purpose of mitigating "mounting dangers to the public health or welfare" caused by air pollution.[80] It is fundamentally arbitrary and capricious for EPA to manufacture a way to avoid regulating existing oil and gas sources, and to relax requirements for new and modified sources, without assessing how many individuals live in close proximity to these facilities. Further, because EPA did not even take this initial step, it also has not considered how its proposals would disproportionately burden children, the elderly, people living below the poverty line, and people of color. Nor did it consider the quantity and geographic distribution of higher emissions resulting from the proposals. Rather than plowing ahead with these ill-considered, dangerous rulemakings, EPA must abandon the proposals and instead move forward with strengthening the current NSPS and promulgating robust standards for existing sources.

Conclusion

EPA must heed the extensive record evidence documenting both the urgency of the problem and the availability of cost-effective solutions to reduce emissions from oil and gas infrastructure. To that end, the agency must withdraw these deeply flawed proposals and immediately take action to regulate the hundreds of thousands of existing sources emitting dangerous pollution.

[80] 42 U.S.C. § 7401(a).

Respectfully submitted,

Rosalie Winn
Jessica Christy
Peter Zalzal
Renee McVay
Kate Roberts
David Lyon
Environmental Defense Fund
2060 Broadway, Ste. 300
Boulder, CO 80302
rwinn@edf.org
(303) 447-7212

Robert M. Routh
Clean Air Council
135 S 19th St #300,
Philadelphia, PA 19103

Darin Schroeder
Clean Air Task Force
114 State Street, 6th Floor
Boston MA, 02109

Robin Cooley
Caitlin Miller
Earthjustice
633 17th St., Ste. 1600
Denver, CO 80909

Aaron Mintzes
Earthworks
1612 K Street NW, Ste. 904
Washington, DC 20006

Adam Kron
Environmental Integrity Project
1000 Vermont Ave. NW, Suite 1100
Washington, DC 20005

Stephanie Kodish
National Parks Conservation Association
706 Walnut Street, Ste. 200
Knoxville, TN 37902

Pete Huffman
Natural Resources Defense Council
1152 15th St. NW, Suite 300
Washington, DC 20005

Andres Restrepo
Sierra Club
50 F St., NW, Eighth Floor
Washington, DC 20001