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April 24, 2015

By Certified Mail

Gina McCarthy  
Administrator  
Environmental Protection Agency  
Ariel Rios Building  
1200 Pennsylvania Ave. N.W.  
Washington, DC 20460

*15-200-8284*

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EPA  
FBI

RE: Clean Air Act Notice of Intent to Sue for Failure to Determine Whether Standards of Performance Are Appropriate for Methane Emissions from Existing Source in the Oil and Gas Sector, and to Establish Such Standards and Related Guidelines for Existing Sources

Dear Administrator McCarthy:

Damascus Citizens for Sustainability Inc., NYH2O, and Citizens for Water respectfully request that the Environmental Protection Agency correct its failure under Section 111 of the Clean Air Act to establish performance standards and emissions guidelines for existing sources to reduce or eliminate emissions of methane from the oil and gas sector. These standards and guidelines must cover all components of the oil and gas sector, including the distribution component, that endanger public health and welfare. In developing these performance standards and emissions guidelines for existing sources, the Agency must use the best available actual emissions data, reserving use of emissions factors and other estimates to only those situations for which actual measurement data is not available. Further, under Section 111, EPA and the states are required to enforce these standards and guidelines once they are adopted. For purposes of the citizen suit provisions of the Act, this letter constitutes notice of a violation under Section 304 of the Clean Air Act.

In 2009 EPA determined that methane and five other greenhouse gases are air pollutants that endanger public health and welfare. See, 74 Fed. Reg. 46,696 (Dec. 15, 2009). Under Section 111(b) of the Clean Air Act, the Administrator is required to publish and periodically to revise a list of categories of stationary sources of air pollutants. Within one year of inclusion of a source category on this list, the Administrator is required to propose regulations establishing standards of performance for new sources in that

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category, and is also required to review and revise a new source performance standard, if appropriate, every eight years. Further, Section 111(d) requires that the Administrator prescribe a procedure similar to the Section 110 implementation plan process for states to establish existing source standards of performance consistent with emission guidelines issued by EPA for a source category. See, 40 CFR §60.22(a).

The oil and gas sector is included in the Section 111(b) list of categories of stationary sources of air pollutants. See, 40 CFR §60.16. EPA promulgated new source performance standards for very limited portions of the oil and gas sector in 1985, but did not complete its eight year review obligation until April 17, 2012, nineteen years late and only after the agency had been sued in *Wild Earth Guardians v. EPA*, No. 1:09-CV-00089 (D.D.C.) and entered into a consent decree.. However, while revising several portions of the oil and gas sector NSPS, EPA did not make any appropriateness determination concerning methane nor did the agency promulgate performance standards or emissions guidelines for methane emissions from the oil and gas sector despite the fact that the agency had found in 2009 (noted above) that emissions of methane endanger public health and welfare. See, 77 Fed. Reg. 49,490 (Aug. 16, 2012). In the preamble to the 2012 oil and gas sector NSPS revisions, the agency concluded on the methane regulation issue that: “In 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 49513 col.3. This rationalization is remarkably similar to the justification for delay in making a decision that was rejected by the U.S. Court of Appeals for the Second Circuit in *Environmental Defense Fund v. Thomas*, 870 F. 2d 892, 900 (“we cannot agree with [EPA] that the Administrator may simply make no formal decision to revise or not to revise, leaving the matter in a bureaucratic limbo...No discernible congressional purpose is served by creating such a bureaucratic twilight zone, in which many of the Act’s purposes might become subject to evasion. ... The district court thus does have jurisdiction to compel the Administrator to make some formal decision as to whether or not to revise the secondary NAAQS.”) Similarly, in *White Stallion Energy Ctr., LLC v. EPA*, 748 F.3d 1222, 1236-12 (DC Cir. 2014), the Court of Appeals for the District of Columbia Circuit upheld EPA’s determination under similar “appropriate” language in Section 112 of the Act that EPA had an obligation to determine whether it was appropriate and necessary to regulate hazardous air pollutant emissions from electric utility steam generating units once it had found from a study directed by the Act that such emissions pose significant public health hazards. The court agreed with the agency that, “The term “appropriate” plainly plays a role: it requires EPA to apply its judgment in evaluating the results of the study.” *Ibid.*, 748 F.3d at 1239 (emphasis added).



The oil and gas sector is the second – largest source of methane emissions nationwide and each component of the sector – production, processing, transmission and distribution – is a significant part of the sector’s methane emissions, as documented in the White House’s “Strategy to Reduce Methane Emissions” released on March 28, 2014 and the EPA white papers on the oil and gas sector published in the spring of 2014. These white papers provide engineering estimates, based on EPA’s standard emissions estimating protocols, of the quantities of methane emitted annually from the 504,000 existing gas wells and 536,000 existing oil wells in the oil and gas sector across the United States. These white papers were prepared by EPA staff based on published information that examined five components of oil and gas development. These components were 1) oil well completions; 2) compressors used in the production and gathering, processing, transmission and storage components of the oil and gas sector; 3) liquids unloading in the production component; 4) emissions from pneumatic devices used in the production and gathering, processing, transmission and storage components; and 5) leaks in the production and gathering, processing, transmission and storage components.

The white papers estimated methane emissions of more than 165,000 metric tons of methane from existing oil well completions; over 2,070,000 metric tons of methane from existing compressors; almost 320,000 metric tons of methane from liquids unloading of existing wells; over 2,137,000 metric tons of methane from existing pneumatic devices; and over 284,000 metric tons of methane from existing leaks. The overall estimate of methane emissions from existing oil and gas components documented in the Agency’s white papers was more than 4,978, 936 metric tons of methane per year. Each of these white papers also identified a number of measures that could be taken to reduce these methane emissions.

It is important to remember what these white papers did not cover. EPA did not produce a white paper on natural gas well completions nor did it include any of the methane emissions from natural gas distribution systems. Leakage from unconventional gas well completions has been documented by several scientific peer – reviewed papers including papers published by Ingraffea, Jackson, Miller, Darrah, Karion, Petron, Armendariz, and Howarth (copies on enclosed CD). In every one of these studies the measured and calculated emissions of methane over each reported study area was substantially greater than emissions estimates reported by EPA, DOE and/or gas industry organizations.





Ingraffea, et al. looked at well completion data collected and reported by the oil and gas division of the Pennsylvania Department of Environmental Protection. This study reviewed over 75,000 compliance reports from over 41,000 conventional and unconventional gas wells drilled between January 1, 2000 and December 31, 2012 in Pennsylvania. Among its findings was that the percentage of wells that leak due to failure of casing and/or cementing (and therefore emit methane) is over 9% for the more recently drilled unconventional (horizontal fracked) wells in northeastern Pennsylvania.

Jackson, et al. found stray methane contamination in 82% (115 of 141) of homes located within one kilometer of hydraulically fractured gas wells in northeastern Pennsylvania (which is included in the Marcellus Shale gas area). Further, by examining concentration ratios for propane and ethane relative to methane levels, they confirmed that the source of the methane was thermogenic (deep sources) rather than biogenic (shallow), consistent with the Marcellus Shale being the source of the methane.

Miller, et al. looked at data reported from ground – level monitors, telecommunication towers, and airplane surveys by the National Oceanic and Atmospheric Administration and by the Department of Energy to assemble a nationwide quantification of atmospheric methane levels. They found that methane concentrations reported by EPA and by the Emissions Database for Global Atmospheric Research (EDGAR) significantly underestimated the methane levels attributable to anthropogenic sources including the oil and gas sector. They reported that nationwide methane levels are 1.6 to 1.7 times the EPA/EDGAR amounts. For the states of Texas, Oklahoma and Kansas the data they analyzed showed that atmospheric methane levels in these states were largely attributable to oil and gas sector sources and were a factor of 6.7 times the EPA/EDGAR amounts.

Darrah, et al. found correlations similar to Ingraffea and Jackson of fugitive methane emissions from oil and gas sector production and processing and elevated groundwater methane levels from areas near gas wells in both the Marcellus Shale area of Pennsylvania and the Barnett Shale area of Texas.

Karion, et al. measured methane emissions during overflights of the Uintah Basin in Utah which had been heavily developed for natural gas and oil. Using mass balance techniques, they determined a leakage rate for the natural gas produced from this basin to be compared with EPA's national leakage rate estimates. For reporting years 2010 –2013, EPA estimated leakage rates of 0.16%, 1.42%, 1.42%, and 0.88% respectively. The Karion team estimated an average methane leakage rate from the Uintah Basin production area of 8.9 % +/- 2.7%, significantly greater than the EPA numbers.





Petron et al. conducted extensive sampling studies in the Denver-Julesburg Basin in Weld County in northeastern Colorado, over an extended period of years. Among other materials sampled, they examined alkane emissions ratios, methane concentrations and benzene levels and determined not only that oil and gas sector activities were the source of these emissions but also that the measured emissions were at least a factor of two greater than any amounts reported by EPA.

Armendariz calculated the average daily emissions from oil and gas sector operations in the Barnett Shale in the Dallas - Fort Worth metropolitan counties, based on publicly reported emissions data. This study included all components of the oil and gas sector that are located in this metro area; interstate pipeline emissions and distribution system emissions in communities beyond the metro area were not included. Emissions examined included VOCs, NO<sub>x</sub>, HAPs, Methane and CO<sub>2</sub>. The study compared these emissions to mobile source emissions of VOCs, NO<sub>x</sub> and CO<sub>2</sub> (i.e. emissions common to both source categories) and concluded that oil and gas sector emissions exceed all mobile source emissions in the Dallas - Fort Worth metropolitan area. The combined natural gas emissions (of which methane is more than 90%) from the various components of the Barnett Shale oil and gas operations for 2009 totaled 313,000 metric tons per year or 6,573,000 metric tons CO<sub>2</sub> equivalent. Armendariz concluded that 95% of the emissions he examined could be captured using methods such as those developed under the EPA Natural Gas STAR Program. He also makes a number of other suggestions for reducing methane, VOC, and NO<sub>x</sub> pollution, including extending the applicability of more restrictive Dallas-Fort Worth area state air emissions standards to all of the Barnett Shale area, and conversion of natural gas fired internal combustion engines with electric engines on compressor stations.

Howarth et al. examined percentage losses of methane from a range of other reports from both government sources and other scientific investigators. Taking the most conservative methane loss percentages from the various stages of gas production, processing, transmission, storage and distribution, Howarth concludes that the conservative range of methane losses is between 3.6% and 7.9% for shale gas production and 1.7% to 6.0% for conventionally produced gas. Notably, Howarth is one of the few that give consideration to methane losses from distribution of natural gas to end users.

Howarth highlights what is perhaps EPA's worst short coming regarding regulating methane emissions from existing sources. EPA's "comprehensive" evaluation of emissions from the oil and gas sector completely excluded any



examination of methane emissions from the distribution component of the oil and gas sector. However, as noted by the EPA Inspector General, EPA's own reports estimate that emissions from distribution facilities constitute over 10% of all methane emissions from the entire oil and gas sector on a nationwide basis. In July 2014 the EPA Office of Inspector General issued a report titled "Improvements Needed in EPA Efforts to Address Methane Emissions from Natural Gas Distribution Pipelines." The EPA Inspector General, appointed by the President with advice and consent of the Senate, is an independent "watchdog" organization that audits EPA's regulatory activities. In the referenced report (copy attached), the EPA Inspector General cites EPA reports that natural gas distribution systems account for 13 million metric tons (CO<sub>2</sub> equivalent) of the nationwide total reported by EPA of 129.9 million metric tons of emissions from natural gas systems, with essentially all of distribution systems releases being methane. The Inspector General report notes that currently EPA does not regulate these methane emissions from distribution systems, either by itself or in combination with the Pipeline and Hazardous Materials Safety Administration.

Not only are methane emissions from natural gas distribution systems over 10% of all methane emissions from the natural gas sector, the reported 13 million metric tons (CO<sub>2</sub> equivalent) converts to over 619,000 metric tons of methane (using the EPA's conversion factor of 21 times CO<sub>2</sub> equivalent). This is more than 12% of all the acknowledged methane emissions from existing sources in the oil and gas sector reported in the EPA white papers (which did not include distribution system leakage).

Experts in gas distribution system operations have reported extensive methane leakage in the distribution systems of Boston, New York and Washington, DC. Using a cavity-ring-down mobile CH<sub>4</sub> analyzer, Phillips et al. mapped all 785 miles of roadways in Boston and identified 3356 methane leaks ranging in size from 2.5 ppm to over 28 ppm of methane. As reported by Jackson, et al., the Washington survey (done by the same team using the same equipment) mapped the 1500 road miles of the capital city and found 5893 methane leaks ranging in size from 2.5 ppm to 88.6 ppm. McKain et al. quantified methane leakage in the gas distribution system of the greater Boston area to be 2.7 % +/- 0.6%, of gas delivered to the distribution system or approximately 15 billion scf per year.

The New York report is structured differently because Manhattan Island comprises only 5% of the land area and 1/3 of the customers of Consolidated Edison's gas service area. Using Consolidated Edison of New York's required annual reports of "lost or unaccounted for" ("LAUF") gas, the expert from Gas Safety Inc. who collected the methane leakage data for all three reports,



estimated that 8.6 billion cubic feet of methane leak per year from the distribution system on Manhattan Island. A copy of the Manhattan report by Gas Safety is attached. For ConEd's entire gas distribution system, the annual leakage quantity based on land area would be 172 billion cubic feet (8.6 bcf x 20). Based on number of customers, the annual leakage quantity would be 25.8 billion cubic feet (8.6 bcf x 3). These leakage amounts for the ConEd distribution system do not include leakages from the other two gas distribution companies in New York owned by National Grid (KeySpan Energy Delivery New York and KeySpan Energy Delivery Long Island) so the city wide annual leakage amount would be substantially greater than the ConEd amounts. Regardless of whether the Boston/Washington approach or the New York approach is used, there is a tremendous amount of methane that leaks or is vented from distribution systems across the nation.

Taken together, the EPA white papers, the scientific literature and reports referenced in this letter clearly demonstrate the significance of current methane emissions from existing facilities in the oil and gas sector and totally support the Agency's finding that existing methane emissions from the oil and gas sector pose significant public health risks. Having reached this conclusion, EPA has an obligation now, rather than at some indefinite time in the future, to decide whether it is appropriate for EPA to promulgate standards of performance and emissions guidelines for new and existing sources of methane emissions in the oil and gas sector. Moreover, the technology exists to develop such standards and guidelines for existing sources based on actual measured emissions, rather than relying on a string of estimates on top of estimates. This includes all components of the oil and gas sector, including the distribution component.

Failure to establish performance standards and emissions guidelines for all existing source components, including the distribution component, is a violation of the Administrator's non-discretionary duties under Section 111 of the Clean Air Act. The language of Section 111 is quite clear; the Administrator "shall review" and "shall revise" NSPS "at least every 8 years." This mandatory language also applies to promulgating standards of performance for additional pollutants not previously addressed when the agency has determined that such pollutants endanger public health and welfare and such pollutants are emitted by an industry sector that is already a category to which standards of performance apply.

As noted above, EPA already has determined that methane is a pollutant that endangers public health and welfare, has listed the oil and gas sector as a category subject to standards of performance, and has determined that the oil and gas sector is a major source of methane emissions. EPA has also

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determined that there is demonstrated technology available to control methane emissions from the oil and gas sector. This includes information developed as part of the Natural Gas STAR program. Each of the EPA white papers published in response to the President's Strategy to Reduce Methane Emissions includes a detailed discussion of available emissions – control technologies for each component of the oil and gas sector.

Having made an endangerment finding for methane emissions and determined that the oil and gas sector is a major source of such emissions and having also identified a range of demonstrated and cost – effective control technologies applicable to the operations of the oil and gas sector, EPA has a mandatory duty to make a determination whether it is appropriate to issue standards of performance and emissions guidelines for existing oil and gas sector sources of methane emissions, including sources of methane emissions from the distribution component of the oil and gas sector.

If EPA does not promptly take steps to establish standards of performance and emissions guidelines for methane emissions from the entire oil and gas sector, it is our intent to file suit in the United States District Court for the District of Columbia to compel such action.

Respectfully submitted,

s/s J. J. Zimmerman

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