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Via Electronic Mail (w/cc to: oilandgas.whitepapers@epa.gov)
Gina McCarthy
Administrator
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RE: Comments on EPA Methane White Papers

Dear Administrator McCarthy:

The Attorneys General of New York, Delaware, Maryland, Massachusetts, Oregon, Rhode Island, and Vermont (together, "States") respectfully submit these comments on the Environmental Protection Agency's five white papers addressing major sources of methane emissions from the oil and gas sector. These papers stem from the Administration's strategy to reduce methane emissions, which EPA acknowledges to be a key element in the President's Climate Action Plan. The States view EPA's publication of the white papers as a positive step in the direction of cutting methane emissions from the oil and gas industry. The States urge EPA to take the next logical step of promptly setting emission standards and guidelines for methane for these sources under sections 111(b) and (d) of the Clean Air Act for the sources identified in the white papers.

1. Background

The Need for Prompt Action to Reduce Greenhouse Gases, Including Methane

Greenhouse gas pollution is warming our planet, with significant and wide-ranging adverse effects to human health and welfare. The recently released U.S. Global Change Research Program's Third National Climate Assessment concludes that the evidence of human-induced global warming continues to strengthen and that impacts are increasing across the country. Finding that "climate change, once considered an issue for a distant future, has moved firmly into the present," the Assessment's authors present compelling bases for the need to

reduce greenhouse gas emissions from major sources, such as the oil and gas sector.[1] Given the strong body of science that demonstrates the impacts on human health and the environment, EPA must act expeditiously to ensure that major sources of greenhouse gases – such as the oil and gas industry – promptly and aggressively limit their emissions. Prompt and effective action in the power generating, industrial, and transportation sectors are required if the U.S. and the rest of the world are to have a reasonable chance of avoiding the most severe impacts of global warming.

EPA determined in its 2009 endangerment finding that methane is one of the six greenhouse gases that endangers public health and welfare. See 74 Fed. Reg. 46,696 (Dec. 15, 2009). Methane is a very potent greenhouse gas. Pound for pound, it warms the climate about 34 times more than carbon dioxide over a 100-year period, according to the Intergovernmental Panel on Climate Change, and even more over shorter periods. As noted in the White House's Strategy to Reduce Methane Emissions (March 2014), methane accounts for about 9 percent of greenhouse gas emissions in the country, and that percentage will rise by 2030 unless measures are put in place to cut those emissions. Id. at 1. Not surprisingly, therefore, the President's Climate Action Plan issued in June 2013 states that curbing emissions of methane is "critical" to our effort to address global climate change. Climate Action Plan at 10.

In evaluating methane emissions from the oil and gas industry, there are four major segments from development to delivery that must be considered during which methane either leaks or is intentionally vented to the atmosphere. Each of these segments represents a significant percentage of methane emissions:

- Production. The production segment includes extraction of oil and gas from a well and use of gathering pipes or lines to move the fuel to a processing facility.
- Processing. The processing segment involves the use of compressors to move natural gas from the well to facilities that remove liquids to create "pipeline quality" gas, which is then shipped via pipelines in the transmission phase.
- Transmission. The transmission segment includes the use of pipelines and compressors to ship natural gas from processing facilities to distributors.
- Distribution. The distribution segment includes the use of city gates to receive the natural gas from pipelines and then distribute the gas through smaller lines to commercial and residential customers.

According to 2012 emissions data from the oil and gas sector, the production segment accounts for approximately 32 percent of methane emissions, the processing segment 14 percent, the transmission segment 33 percent, and the distribution segment 20 percent. U.S. EPA, Greenhouse Gas Inventory Report (April 2014), Table 3-43. Because each of these segments represents a significant percentage of emissions, a successful strategy to reduce methane must address all four segments. EPA has previously acknowledged that its authority under the Clean Air Act covers emissions from all of these segments. 76 Fed. Reg. at 52,745.

[1] U.S. Global Change Research Program, Climate Change Impacts in the United States: The Third National Climate Assessment (doi:10.7930/J0Z31WJ2) (Jerry M. Melillo, Terese (T.C.) Richmond, and Gary W. Yohe, eds. 2014).

The critical need to limit methane emissions was further underscored by EPA's recently-proposed Clean Power Plan targeting greenhouse gas emissions from existing power plants. One of the underpinnings of that rule is to encourage states to switch from energy generation using coal to generation using natural gas and lower carbon-intensive fuels. Because of the readily-available supply of natural gas in this country, and the fact that natural gas is mostly methane, we must act to ensure that the global warming benefits of switching from coal to natural gas are not diminished because of the release of methane throughout the natural gas system. According to a recent World Resource Institute report, cutting methane leakage rates from natural gas systems to less than one percent of total production would ensure that the climate impacts of natural gas are lower than coal or diesel fuel. World Resources Institute, Clearing the Air: Reducing Upstream Greenhouse Gas Emissions from U.S. Natural Gas Systems (March 2013).

State Action on Reducing Methane Emissions from the Oil and Gas Sector

It is the States' position that not only is targeting methane emissions a necessary component of a successful strategy to address global warming, it is required under the Clean Air Act. In that vein, in December 2012, seven of the States sent a notice of intent to sue EPA based on the agency's failure to set emission standards for methane in its 2012 New Source Performance Standard (NSPS) rule for the oil and gas sector, 77 Fed. Reg. 49,490 (Aug. 16, 2012). Oregon sent a similar notice of intent in June 2013. As explained in the notice letters, EPA has determined that emissions of this potent greenhouse gas endanger public health and welfare, and that processes and equipment in the oil and gas sector emit vast quantities of methane. We further explained that EPA has compelling data, including from 18 years of experience administering the Natural Gas Star Program, demonstrating that many measures to avoid (or reduce) methane emissions from new and existing oil and gas operations are available and cost-effective. In light of these findings, EPA's failure to determine in its 2012 rulemaking whether it is appropriate at this time to set standards limiting methane emissions from oil and gas operations under section 111 of the Clean Air Act is a violation of a nondiscretionary duty of the Administrator or constitutes an unreasonable delay in taking agency action.

Although the 60-day and 180-day notice periods to bring a nondiscretionary duty and unreasonable delay claim, respectively, have now expired, the States have chosen not to file a lawsuit as of this date in light of the President's subsequent commitment that EPA and other federal agencies would examine how to reduce methane emissions from the oil and gas sector. See Climate Action Plan at 10. This commitment was fleshed out in the Administration's Strategy to Reduce Methane Emissions, which was issued on March 28, 2014. As set forth in the methane strategy document, EPA's issuance of technical white papers is the first step in a process in which the agency is considering direct regulation of methane in the oil and gas sector through rulemaking. Methane Strategy at 2. Under this schedule, the agency would issue any proposed rule this fall, to be followed with the promulgation of a final rule and deadline for state implementation plan submittals by the end of 2016. Id.

In the meantime, a number of states – including Colorado, Ohio, and Wyoming – have enacted regulations to prevent methane leaks from the oil and gas sector. Colorado's rules, passed in February, govern both new and existing wells and require leak inspections either monthly, quarterly, or annually, depending on the amount of emissions. Colorado has stated that

it expects these regulations, which target methane emissions directly rather than as a co-benefit of reducing other pollution, to reduce methane emissions by approximately 65,000 tons per year.

2. Comments on Methane White Papers

EPA's five white papers describe sources of methane emissions in the oil and gas sector and methods that are available to limit those emissions. The States' comments on each of these white papers (Oil and Gas Sector Leaks, Hydraulically Fractured Oil Well Completions and Associated Gas during Ongoing Production, Pneumatic Devices, Compressors, and Liquids Unloading Processes) are set forth below.

Leak Detection and Repair

EPA's "Oil and Natural Gas Sector Leaks" white paper acknowledges that as the oil and natural gas exploration and production industry in the U.S. grows rapidly, so does the potential for greater methane emissions from leaks. As EPA notes, "leak emissions occur through many types of connection points (e.g., flanges, seals, threaded fittings) or through moving parts of valves, pumps, compressors, and other types of process equipment." Oil and Natural Gas Sector Leaks White Paper at 3. The white paper identifies a number of different leak detection technologies, including portable analyzers and infrared cameras, which are readily available and inexpensive. As discussed in the recently issued report by Carbon Limits, "Quantifying Cost-effectiveness of Systematic Leak Detection and Repair Programs Using Infared Cameras," (March 2014), infrared cameras can be used relatively inexpensively to scan an entire facility for leaks. Furthermore, EPA has determined that "once a leak is found it is almost always economical to repair the leak" and that inspection and maintenance programs "can effectively decrease leak emissions." Id. at 55. In light of these findings that leak detection and repair programs can effectively reduce methane emissions from leaks at a reasonable cost, EPA should follow the lead of states such as Colorado that have made these programs mandatory.

Unfortunately, the white paper leaves out a significant source of methane leaks by excluding methane emissions from the distribution sector, *i.e.*, only considering leaks that are "upstream of the city gate." Oil and Natural Gas Sector Leaks White Paper at 3. As EPA noted above, however, EPA has found that methane leaks in distribution from city gates and associated above-ground facilities and from underground pipes comprise about one-fifth of methane emissions from the oil and gas sector. As a result, leaving this segment unaddressed would undermine the President's goal of significantly cutting methane from the oil and gas sector as an important strategy to address global warming.

Distribution sector methane leaks present significant environmental, economic, and safety concerns for states. In Massachusetts alone, leaking pipelines are estimated to release between eight and twelve billion cubic feet of methane a year, at a cost of about $38 million per year to customers. Shanna Cleveland, *Into Thin Air: How Leaking Natural Gas Infrastructure is Harming Our Environment and Wasting a Valuable Resource* (CLF, Boston), Nov. 2012, at 7, 12, available at http://www.clf.org/static/natural-gas-leaks/WhitePaper_Final_lowres.pdf. A number of recent studies have documented extensive leaks from thousands of miles of underground piping in cities such as Boston, New York, and Washington, D.C. See, e.g., Nathan

G. Phillips, et al., Mapping Urban Pipeline Leaks: Methane Leaks Across Boston, Environmental Pollution, Vol. 173 (Feb. 2013) at 1-4 (copy attached). For example, a team using infrared imaging discovered 3,356 leaks with fifteen times the global background level for methane in Boston alone. Gas distribution companies in 2011 reported releasing 69 billion cubic feet of natural gas to the atmosphere, almost enough to meet the state of Maine's gas needs for a year and equal to the annual carbon dioxide emissions of about six million automobiles. See *America Pays for Gas Leaks: Natural Gas Pipeline Leaks Cost Consumers Billions* (Staff Report Prepared for Senator Edward J. Markey, Washington, D.C.) Aug. 2013, at 2 & 7, Table 3, available at: http://www.markey.senate.gov/documents/markey_lost_gas_report.pdf. As a result, nationally consumers paid at least $20 billion from 2000-2011 for gas that was unaccounted for and never used. Id. at 1.

Some states have undertaken efforts to deal with this problem. Since 2009, Massachusetts has promoted replacement of leaking distribution pipeline through the use of Targeted Infrastructure Replacement Funds that provide for expedited reimbursements to utilities that replace aging steel and cast iron infrastructure, as opposed to the use of traditional rate recovery. The Massachusetts Department of Public Utilities has also opened an investigation into the Service Quality Standards for local electric and gas distribution companies that is investigating, among other items, appropriate metrics for leak detection and response. And, the Massachusetts Legislature recently took up legislation (H3873 and S2073, currently in conference committee) to address gas leaks. Similarly, in New York, the New York Attorney General's Office successfully argued to the Public Service Commission that Consolidated Edison should be required to increase it rate of replacement of old distribution system pipes in New York City in order to reduce methane emissions. As a result of that proceeding, Con Ed is also conducting a study to improve detection of distribution system leaks and quantification of associated leak rates. Although these state efforts represent important steps, federal action is needed to drive a more concerted, immediate effort to eliminate leaks and reduce methane emissions from the distribution segment.

In light of the significant emissions from the distribution segment, at a minimum EPA should broaden its scope of potential regulatory action to encompass emissions from city gates, which the agency has previously identified as the largest source of methane emissions in distribution. See EPA, Technical Support Document: Petroleum and Natural Gas Systems for the 2010 Final Rule – Mandatory Reporting of Greenhouse Gases from Petroleum and Natural Gas Systems – Subpart W, at 76, available at: http://www.epa.gov/ghgreporting/documents/pdf/2010/Subpart-W_TSD.pdf. City gates are metering and pressure regulating facilities located at the custody transfer points where natural gas is delivered from transmission pipelines into the lower pressure lines of local distribution companies. Distribution providers that are participants in EPA's Natural Gas STAR program have reported significant savings and methane emission reductions by implementing inspection and maintenance programs of city gates, which are easier to fix than underground piping. Based on data provided by these companies, implementing these programs at gate stations and associated above-ground facilities can result in gas savings worth up to $1,800 per year, at a cost between $20 and $1,200. EPA, Lessons Learned: Directed Inspection and Maintenance at Gate Stations and Surface Facilities, Pub. No. EPA430-B-03-007 (2003).

Hydraulically-Fractured Oil Wells

The white paper on hydraulically-fractured oil wells and associated natural gas production underscores the need for emission standards and guidelines for these sources. In its 2012 NSPS, EPA did not include "oil wells" in the definition of affected facilities, so those wells are currently exempt from rule's reduced emission completion, *i.e.*, "green completion," requirements that apply to hydraulically-fractured gas wells. The NSPS rule requires flaring of gas wells until January 1, 2015, at which time producers will need to use green completion equipment to separate out the gas from the water and send the gas into pipelines, where it subsequently can be sold.

The white paper supports the conclusion that hydraulically-fractured oil wells (either completion of a newly-fractured well or re-stimulation of a previously fractured well and ongoing production) are also significant sources of both methane and volatile organic compound (VOC) emissions. For example, the Environmental Defense Fund/Stratus study cited in the white paper estimated methane emissions from hydraulically-fractured oil well completions (venting, flaring, etc.) at approximately 247,000 metric tons of methane per year. An ERG/ECR study cited in the white paper estimated VOC emissions at approximately 116,230 tons per year (assuming a 7-day flowback period). Furthermore, the emission figures for methane at least may underestimate the amount of those emissions given that aerial, or "top down" surveys of oil fields in Colorado, Utah, and elsewhere have detected much higher levels of methane than found in the "bottom up" studies in the white paper.

The white paper further shows that the types of measures required for gas wells (complete combustion, green completions) as well as other alternative technologies are available to limit methane and VOC emissions from oil wells. Although the cost effectiveness of these measures appears to vary depending upon different factors, such as the existence of nearby gas pipelines, those considerations can be addressed in the context of implementing the requirements to hydraulically-fractured oil wells.

Compressors and Pneumatic Devices

Regarding the white papers addressing compressors and pneumatic devices, in the 2012 NSPS rulemaking, EPA identified compressors (reciprocating and centrifugal) and pneumatic devices (controllers and pumps) in the natural gas transmission segment as equipment that emits large quantities of methane. But at the time, EPA declined to establish standards to limit these emissions based on its approach of focusing on reducing VOCs, which are largely removed by the time the natural gas stream reaches compressors and pneumatic devices in the transmission segment. See 77 Fed. Reg. at 49,522-23 (declining to regulate transmission compressors and pneumatics because of "the relatively low level of VOC emitted from these sources").

In light of the President's subsequent commitment to reduce methane emissions and the issuance of the methane strategies document, a VOC-focused rationale is no longer supportable. The white papers for compressors and pneumatic devices confirm that this equipment is the source of significant amounts of methane emissions. According to EPA, compressors emitted more than 2 million tons of methane in 2012, with more than 50 percent of that amount coming

from the transmission segment. Oil and Natural Gas Sector Compressors White Paper at 43. Similarly, EPA estimates that pneumatic controllers are responsible for about 13 percent of methane emissions from the oil and gas sector, while pneumatic pumps account for about 16 percent of methane emissions from the production and processing segments. Oil and Natural Gas Sector Pneumatic Devices White Paper at 56-57.

Moreover, both of the white papers demonstrate that methane can be significantly and cost-effectively reduced by establishing emission standards for methane from compressors and pneumatic devices. Centrifugal compressor emissions may be cost-effectively controlled by using dry seals in place of wet seals, while reciprocating compressor emissions may be controlled by the periodic replacement of rod packing systems. Compressors White Paper at 43. Pneumatic controller emissions can be significantly reduced by replacing high-bleed controllers with either low- or zero-bleed controllers, while methane from pneumatic pumps can be cut in many instances by replacing them with instrument air pumps and electric pumps. Pneumatic Devices White Paper at 56-57. These findings in the white papers are consistent with previous EPA determinations concerning this equipment and in other studies. See, e.g., EPA, "Reducing Methane Emissions from Compressor Rod Packing Systems" (Oct. 2006) at 1 (indicating payback periods from 1 to 3 months for compressor maintenance activities that reduce methane emissions); WRI Clearing the Air report at 6 (replacing existing high-bleed pneumatic devices with low-bleed equivalents throughout natural gas system identified as one of three strategies that could cost-effectively cut methane emissions by 30 percent); Natural Resources Defense Council, "Leaking Profits: The Oil and Gas Industry Can Reduce Pollution, Conserve Resources, and Make Money by Preventing Methane Waste," (2012) (improved maintenance of reciprocating compressors and replacement of high-bleed pneumatic controllers with low-bleed or zero-bleed controllers identified as two of ten cost-effective strategies that could reduce methane emissions from oil and gas sector by 80 percent).

Liquids Unloading

The white paper on liquids unloading discusses methane and VOCs that are emitted when companies periodically open mature wells to the atmosphere to unload well bore liquids, such as water and condensate, which accumulate in the bottom of the well. This process, typically referred to as a "well blowdown," can result in large quantities of methane and VOCs being released. Although emission figures vary, EPA estimates that methane and VOC emissions from liquids unloading comprised about 14 percent of emissions from the natural gas production segment in 2012.

Rather than using well blowdown methods to unload liquids and allow the flow of gas from the well to resume, there are available technologies that perform this same function while significantly reducing emissions. As the white paper notes, plunger lifts are the most common of the technologies. Of these, the use of optimized plunger lift systems (e.g., those that use smart well automation) offer the dual benefits of decreasing the amount of emissions by more than 90 percent while reducing the need for venting due to overloading. Oil and Natural Gas Sector Liquids Unloading Processes White Paper at 16; see also NRDC Leaking Profits report at 24-25 (summarizing emission reductions attributable to use of plunger lift systems). Previous studies have also demonstrated that plunger lift systems are cost-effective. Id.; WRI Clearing the Air

report at 6 (identifying use of plunger lift systems at new and existing wells during liquids unloading as one of three technologies that could cut methane emissions in the oil and gas sector by 30 percent). Other available technologies – such as artificial lifts, velocity tubing, and foaming agents – can achieve even greater emission reductions, eliminating emissions entirely from liquids uploading. Liquids Unloading White Paper at 17-18.

3. Conclusion

In summary, EPA's publication of the white papers for the oil and gas sector represents a positive step in implementing the President's directive to significantly cut methane emissions from this industry. The States urge EPA to take the next logical step of proposing emission standards and guidelines for methane for the sources discussed in the white papers under sections 111(b) and (d) of the Clean Air Act, as it has done recently with carbon dioxide emissions from power plants. In light of the potency of methane as a short-term accelerator of global warming, the States urge EPA to act in expedited fashion by proposing standards and emission guidelines by this fall.

Sincerely,

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