Submitted via email

November 30, 2011

Gina McCarthy
Assistant Administrator
U.S. Environmental Protection Agency
Office of Air and Radiation
Mail Code: 6101A
Washington, DC 20460

Re: Oil and Natural Gas Sector Consolidated Rulemaking,
Docket ID No. EPA-HQ-OAR-2010-0505

Dear Assistant Administrator McCarthy,

The Independent Petroleum Association of America submits these comments with respect to the United States Environmental Protection Agency's (EPA) Proposed Rules entitled "*Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews*", dated August 23, 2011 (76 FR 52738).

These comments are filed on behalf of the Independent Petroleum Association of America (IPAA), the International Association of Drilling Contractors (IADC), the International Association of Geophysical Contractors (IAGC), the National Stripper Well Association (NSWA), the Petroleum Equipment Suppliers Association (PESA) and the following organizations:

Arkansas Independent Producers and Royalty Owners Association
California Independent Petroleum Association
Coalbed Methane Association of Alabama
Colorado Oil & Gas Association
East Texas Producers & Royalty Owners Association
Eastern Kansas Oil & Gas Association
Florida Independent Petroleum Association
Illinois Oil & Gas Association
Independent Oil & Gas Association of New York
Independent Oil & Gas Association of West Virginia
Independent Oil Producers Agency
Independent Oil Producers Association Tri-State
Independent Petroleum Association of New Mexico
Indiana Oil & Gas Association
Kansas Independent Oil & Gas Association
Kentucky Oil & Gas Association
Louisiana Oil & Gas Association
Michigan Oil & Gas Association
Mississippi Independent Producers & Royalty Association
Montana Petroleum Association
National Association of Royalty Owners
Nebraska Independent Oil & Gas Association

New Mexico Oil & Gas Association
New York State Oil Producers Association
North Dakota Petroleum Council
Northern Alliance of Independent Producers
Northern Montana Oil and Gas Association
Ohio Oil & Gas Association
Oklahoma Independent Petroleum Association
Panhandle Producers & Royalty Owners Association
Pennsylvania Independent Oil & Gas Association
Permian Basin Petroleum Association
Petroleum Association of Wyoming
Southeastern Ohio Oil & Gas Association
Tennessee Oil & Gas Association
Texas Alliance of Energy Producers
Texas Independent Producers and Royalty Owners Association
Utah Petroleum Association
Virginia Oil and Gas Association
West Virginia Oil and Natural Gas Association
Western Energy Alliance

Collectively, these groups represent the thousands of independent oil and natural gas explorers and producers, as well as the service and supply industries that support their efforts, that will be the most significantly affected by these proposed regulatory actions. Independent producers drill about 95 percent of American oil and natural gas wells, produce about 56 percent of American oil, and more than 85 percent of American natural gas.

In addition to the specific comments made herein, we support those comments submitted separately by the participants in these comments. In general, we also support the comments submitted separately by the American Petroleum Institute (API), the American Exploration and Production Council (AXPC) and America's Natural Gas Alliance (ANGA). However, in some instances we believe that the proposed regulations are in such significant need of reevaluation that the only recourse is reconsideration and reproposal of regulations.

This proposed rulemaking would modify the New Source Performance Standards (NSPS) 40 CFR Part 60 Subparts KKK and LLL, create a new Subpart OOOO, and modify Part 63 Subparts HH and HHH. These rules are being addressed together under the auspices of EPA's sector-based rulemaking for the oil and natural gas industry. Our comments will address two aspects of the proposal: the NSPS for natural gas well completions and the NSPS for crude oil and condensate storage facilities.

In developing NSPS, EPA must meet the following definition:

> The term "standard of performance" means a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.

This definition includes key factors that must be addressed in an NSPS determination. It must consider cost effectiveness. It must consider energy implications. It must be adequately demonstrated for the application that will be regulated. We believe that EPA has failed to meet these requirements with regard to well completions and storage facilities. In large measure, it fails to meet these requirements because its emissions analyses are inaccurate and its application to segments of the industry fails to be adequately demonstrated and cost effective.

Well Completions

Vertical Well Issues

EPA's definition of a natural gas well completion creates a significant inequity. EPA applies its NSPS requirements to any natural gas well completion that uses hydraulic fracturing. The sweep of this definition would capture natural gas well completions that include only a vertical component and wells with both vertical and horizontal components. However, it is clear that in developing its basis for its reduced emissions completion (REC) or "green completion" technology, EPA bases its determinations on well completions with horizontal legs. Yet, EPA would require the same controls for vertical wells where the emissions would be far less.

Requiring REC on all natural gas well completions makes no sense. There are over 50 depositional basins across the United States that produce oil and natural gas. EPA has only visited a few of them. While there can be similarities in fracturing treatments within a particular formation or depositional basin, there can be big differences between basins across the country. Virtually all of the non-conventional, horizontal completions use large-volume multi-stage hydraulic fracturing treatments, while most of the conventional, vertical well fracture treatments are relatively low volume, single stage events. Applying a one-size-fits-all standard to both types of wells is counterproductive.

If REC remains an option rather than a requirement for conventional vertical natural gas wells, it will continue to be integrated naturally into the flowback process where it is cost-effective and appropriate. However, there are many circumstances where REC is not only inappropriate, but provides little or no environmental or economic benefit. The post-fracturing conditions are more diverse with conventional, vertical well completions than with non-conventional, horizontal well completions.

After a conventional, vertical well is hydraulically fractured, the reservoir pressure may not be high enough to clear the well bore of fluid. If the reservoir pressure is not high enough, the well must have pressure added to artificially help initiate, or "kick-off", return flow. One method is to use a jet pump. A jet pump is run on tubing down the hole and water is pumped down the tubing at pressures as high as 3,000 psig. Located at the bottom of the tubing, small pin holes point upward into the tubing/casing annulus. The flow of high-pressure water from these holes creates a low-pressure zone at the bottom of the well bore that helps to start the gas flowing out of the formation.

A more expensive process is to pump nitrogen down the hole to help clean out fluids remaining in the well bore. Or, liquid carbon dioxide can be used as a fracturing fluid. Both of these options make the flow-back non-combustible, so the flow-back gas cannot be sold to the pipeline or flared. Under these conditions it would not be feasible to use the REC process.

The factors that affect the characteristics of the post-fracturing flowback process vary considerably with conventional, vertical well fracture treatments. These factors include:

1 – The depth of the well;
2 – The thickness of the formations;
3 – The reservoir pressures;
4 – The type of formations;
5 – The type of fracturing fluid used (water, carbon dioxide, nitrogen);
6 – The amount (#/gal) of proppant used;
7 – The amount of treatment fluid recovered;
8 – The ability of the well to flow against the back-pressure of the fluid in the hole;
9 – The need for a jet pump to kick-off the well;
10 – The amount of time needed to clear the well;
11 – The ability to flair the flow back gas; and,
12 – The ability to sell the flow back gas.

The goal of all producers is to stop venting or flaring and start selling the natural gas as soon as possible. It is a matter of economics. If the choice of how to clean up the well after fracturing remains with the producer, REC will be implemented when economically feasible or when required for safety reasons.

The consequences would be severe for these smaller wells. Significantly, most of these vertical wells would be developed by producers many of which are small businesses. Since the natural gas well REC requirements were developed for large horizontal shale gas wells, the distinctions between horizontal wells and vertical ones are pertinent. Many smaller independents are drilling traditional vertical wells that are completed in traditional sandstone and limestone formations. The completions usually take just a few hours. Instead of treating 5,000 feet of a shale formation they are treating 30 to 100 feet of sandstone or limestone. The flowback differs from formation to formation and is usually directed into a lined pit. The goal is to clean out the sand from the well quickly and get the natural gas into the production pad separation equipment and then into the pipeline meter. With the flowback time and volume so much smaller in vertical wells, it is hard to justify separation equipment for a small amount of sand. Additional complexities depending on the nature of the particular formation can be significant.

Wells developed in Kentucky are illustrative. Producers in Kentucky report that if they were required to only perform REC on their wells the entire natural gas production industry could be halted. Currently, because of the low formation pressure on these Shale Gas reservoirs, completion stimulation is done with nitrogen. A typical fracturing process on these shale gas formations is either a "Foamed Frac" using a proppant of sand and conveyed into the formation in an energized fluid made up of mostly nitrogen, or a "Gas Frac" where nitrogen as a gas is the only material pumped down hole to break the rock. In both cases, after the stimulation treatment, the well's flowback is released to the atmosphere until the flow is clean enough to sell into the pipelines. The advantage to these types of completions is that they clean up relatively quickly, use nitrogen which is inert, and the locations needed to drill the wells are kept relatively small compared to the amount of gas bearing reservoir that is developed. No one can tell exactly how much methane is in the nitrogen released back to the atmosphere but it would likely be more than the 100 Ton (4MMcf) limit EPA proposes. Proving the amount released would be difficult and present a burden on the operator. Importantly, there is no way to separate the nitrogen from the flowback stream in order to sell the natural gas as would be required in a REC of a "non-exploratory" well. Even the alternative for "exploratory" wells, allowing the flowback stream to be flared, is not possible during most of the clean up procedure because the nitrogen levels would be too high for the natural gas to burn. Shortly before the clean up is complete, the nitrogen levels would drop low enough that the vented gas could possibly burn, but it would need a large flare pit, which would require the clearing of many more trees in Kentucky's forested areas than are required for the drilling location.

While the Kentucky example may have some unique aspects, the application to vertical wells is far broader. As an example of impacts of this regulation on small operators, consider wells drilled in Pennsylvania (from the PA DEP website):

Year	**Marcellus**	**Non-Marcellus**	**Total**
2005	2	3,653	3,655
2006	11	4,175	4,186
2007	34	4,129	4,163
2008	210	4,039	4,249
2009	768	1,775	2,543
2010	1,446	1,397	2,843
2011 (to 9/31)	1,397	683	2,080

It is safe to assume that all wells were completed with hydraulic fracturing. As can be seen from the DEP statistics, since 2006, the number of Marcellus wells being drilled is rapidly increasing while the number of non-Marcellus wells and the total number of wells drilled is declining. When looking at the data over the 5-year period from 2006 through 2010, there was an average of 494 Marcellus and 3,103 non-Marcellus wells drilled per year. By considering the county locations of the oil patch and of the 3,103 average non-Marcellus wells during those same years, there were an average of 2,132 gas wells and 971 oil or combination oil and natural gas wells drilled per year. As mentioned above, these non-Marcellus natural gas wells are completed in a few hours. If natural gas collection lines have not yet been constructed, costs for these average 2,132 natural gas wells could be as high as $7.5M based on EPA cost information. If natural gas collection lines are available, and again applying EPA cost information and recognizing that these shallow, vertical, stripper gas wells (less than 60 MCF/day average production) will not produce much natural gas and condensate during flowback, the cost for these same wells could be as high as $8.8M. These estimates do not include costs for combination wells. These average costs of $3,523 to $4,146 per vertical well will make many of these wells uneconomical. These wells should be exempt from the proposed regulation.

Emissions Estimates

Regardless of the type of well, the NSPS proposal suffers from inaccurate data on emissions from natural gas well completion. From several accounts EPA's assessment of well completion emissions is based on a small number of instances improperly interpreted and inappropriately escalated to a national estimate. Much of this inaccuracy is presented in the IHS CERA report, *Mismeasuring Methane, Estimating Greenhouse Gas Emissions from Upstream Natural Gas Production*. The analysis points out specific EPA analytical flaws EPA, including:

- The misuse and inaccurate application of Natural Gas STAR program data collected from a small number of wells to assume industry-wide emission rates — based on the erroneous assumption that methane reported as captured through "green completions" would otherwise be vented to the atmosphere when a green completion is not performed.

- EPA's flawed rounding of data points to the nearest hundredth, thousandth, and even ten thousandth Mcf to overcome the "high variability and uncertainty" in the industry — masking a lack of consistent and reliable data that would undermine the EPA conclusions.
- Developing an assumption that producers in Texas, New Mexico and Oklahoma vent to the atmosphere during flowback, rather than commonly flaring or capturing emissions, simply because those states do not mandate flaring or recovery.

The consequences of overstating emissions in the development of NSPS requirements are threefold. First, overstating emissions leads EPA to conclusions that it needs to address operations based on expectations that the facilities present a major cause for regulatory action. Fully understanding the scope of emissions is essential to making appropriate regulatory targeting judgments. Second, in a NSPS determination, EPA is deciding which of several technologies "reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements)" and whether it has been adequately demonstrated in that application. If the emissions are overestimated EPA will make conclusions that are not well founded. The technology's cost effectiveness will be overstated. Similarly, if the demonstration of the technology's use is based on concentrations of compounds that will be higher than those in reality, it may not function properly. Third, overestimation will assure that the anticipated emissions reductions will never occur.

In the proposed NSPS, the extent of overestimation is extraordinarily high. Following the assessments of EPA's determinations of its emissions basis, companies have reviewed operations and evaluated completion estimates more fully. The results show errors not in percentages but orders of magnitude. One company – that had been active in the Natural Gas STAR program used by EPA for some of its estimations – concluded that EPA's estimates were 14 times the company's actual emissions.

Recommendations

EPA's action on this proposed NSPS has been rushed because of its consent decree with WildEarth Guardians and the San Juan Citizens Alliance. Regulatory actions that can fundamentally influence the ability of independent producers to develop America's natural gas should not be driven by court agreement; they should be driven by science and cost effective technology. Given the vast overestimation of emissions from natural gas well completions and the overly broad scope of the EPA definition of fractured natural gas wells that treats verticals wells and horizontal ones identically, we believe that EPA should not issue these standards. Rather, it should carefully evaluate these emissions and then consider what – if any – additional action is needed.

Storage Vessels

Similar issues arise with regard to the NSPS on storage vessels. The NSPS applies to oil and condensate storage tanks and present both issues associated with the impact on small businesses – particularly with regard to regulations being applied to "modified" tanks and associated with the underlying data to justify action. Compounding these aspects is EPA's decision to propose a performance based requirement of a 95 percent reduction in emissions.

Scope of Regulation

While the proposal is cast as a NSPS, it would also apply if a facility is considered to be modified. EPA has attempted to simplify the determination of whether a facility is subject to the regulation by using a throughput basis – 20 barrels/day for crude oil and one barrel/day for condensate. While simpler, the throughput approach is not technically sound or supported by the data. However, it can result in substantial exposure consequences for marginal well operators.

Storage tank capacity must be designed to manage production when a production site is initiated. Over time, production from wells decline. As a well field develops, additional wells are piped to common storage tanks in a tank battery. This basic tank battery system remains in place as existing wells decline and are plugged, as new wells are drilled and begin production, and as existing wells are reworked to increase production. An average marginal well in the United States produces about 2 barrels/day. When a well is reworked, its production may increase to 4 or 5 barrels/day for six or eight months before declining back to its prior flow rate. Even though EPA bases its throughput thresholds on an annual average of daily production, clearly, the consequences of normal well field development could result in a storage tank being under the threshold for one year, over the threshold the next year and below again the year after. Under the proposed NSPS, exceeding the threshold would require equipping the tank with a vapor recovery unit (VRU) or flaring system that would no longer be required by the time it was in place.

Such a requirement creates both economic and safety issues. A marginal well producing operation would be hard pressed to economically absorb the costs of a VRU or flare system. If the tank battery receives substantial volumes of produced water, it may have electricity to power a pump to send produced water to a disposal well. If not, new electric service will have to be run to the site. If the site produces only oil, it likely will not have a natural gas pipeline near and an automatic flare must be used.

Oil field stock tanks that contain crude oil, condensate and produced water are typically constructed with a thief hatch at the top of the tank. This hatch is accessed to measure the amount and conditions of the liquid when it is sold. It also serves as a safety device that will relieve the tank of a vacuum to keep the tank from collapsing and that will relieve the tank from pressure increases to keep the tank from bursting. The tank has another safety valve that is usually located in the center of the top of the tank. These safety valves are rarely calibrated because it requires walking on the tank roof, which is considered to be an unsafe practice. From conversations with oil field engineers, it is possibly as high a 30 percent of tanks triggered for emissions control could require replacement. The main reason for the replacement is the potential that the existing tanks would allow oxygen into the vapor recovery process and create an explosive mixture.

The current proposal does not reflect these realities. They are compounded by errors in the estimates of emissions.

Emissions Estimates

Most of EPA's assessment of storage tank emissions comes from a relatively narrow study in Texas. Using this limited base cannot generate the robust information needed to determine whether the VRU or flare control requirements can be adequately demonstrated to provide a 95 percent reduction in emissions. Moreover, EPA compounds the issue by drawing an arbitrary line to define what constitutes crude oil and condensate with the attendant consequence that falling on the wrong side of the line results in a twenty-fold reduction in the throughput that subjects the tank to regulation.

Moreover, EPA's emissions rate for condensate is substantially higher than other estimates. EPA uses a Volatile Organic Compound (VOC) emissions factor of 33.3 lbs/barrel of throughput. Other analyses such as the Colorado Department of Public Health and Environment determined that emissions rates in Colorado are more likely to range from 10.0 to 13.7 lbs/barrel. Consequently, EPA will overstate condensate emissions at any given throughput by a factor of roughly three. As a result, EPA's determination that its NSPS technology will produce a 95 percent reduction must be called into question.

Recommendations

We believe sources should have the ability to estimate VOC emissions from storage tanks rather than be constrained to a throughput based process. If EPA continues to pursue a throughput based approach, it needs to recognize that a more sophisticated approach should be developed. For example, we understand that API is submitting an alternative throughput look-up table for determining exemptions from the storage tank standards in its comments. A critical action that EPA needs to take is addressing the issue of applying its regulations to existing tanks. It needs to develop an approach that does not create an unreasonable burden on existing production, particularly marginal well operations, resulting from short term increases in production. Consequently, we recommend that EPA withdraw the current proposal, develop better emissions assessments and subsequently revisit the technology requirements.

Conclusion

We believe that the current NSPS proposal fails in two key areas for both the REC for fractured natural gas wells and emissions from storage vessels. In each case the emissions assessments are faulty and need substantial improvement. In each case the scope of the proposal threatens smaller producers and marginal well operations due to inadequate analysis of the effects on these components of American natural gas and oil production. Consequently, we believe that EPA should determine not to proceed with these proposals, develop better emissions estimating tools and revisit the determination of an NSPS based on that new information. We are ready to participate in such future efforts. If there are questions or a need for additional information, please contact me at 202-857-4731 or by email at lfuller@ipaa.org.

Sincerely,

Lee O Fuller

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IPAA