

A CLOSER LOOK AT NEW METHANE REDUCTION REGULATIONS TARGETING THE OIL AND GAS INDUSTRY

PBI 8th Annual Oil & Gas Colloquium, July 2016

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I. Introduction

Over the past year, the Environmental Protection Agency (“EPA”) and DEP have targeted methane emissions in the oil and gas industry. EPA finalized New Source Performance Standards (“NSPS”) targeting processes and equipment in the oil and natural gas industries such as hydraulically fractured oil well completions, pneumatic pumps, fugitive emissions from well sites, and compression sites. EPA claims that the NSPS will prevent 300,000 tons of methane emissions and 150,000 tons of volatile organic compound (“VOC”) emissions by 2020. The NSPS applies to new, modified, and reconstructed sources in the oil and natural gas industry, not existing sources.

However, EPA has released a draft Information Collection Request (“ICR”), signaling the agency’s intent to regulate emissions from existing sources. The information being sought through the ICR will be used by EPA to craft regulations aimed at reducing methane emissions from existing sources. Oil and gas companies will be asked to provide information such as the optimal configuration for installing emission controls and related equipment, and the cost of making such improvements. The ICR is open to comment through August 2, 2016. Once finalized, oil and natural gas companies will be required to provide EPA with the requested information.

Pennsylvania Governor Tom Wolf also announced that his administration would be targeting methane emissions by adopting and building upon EPA’s NSPS. DEP released *A Pennsylvania Framework of Actions for Methane Reductions from the Oil and Gas Sector*, which outlines a four-point approach to regulating methane emissions from Pennsylvania’s oil and natural gas industry.

II. EPA Initiatives

A. Background on EPA’s NSPS

1. NSPS first adopted in June 1985 to address VOC and sulfur dioxide emissions from natural gas processing plants.
2. EPA is required to review and revise the NSPS at least every eight years.
3. EPA last undertook a revision of the NSPS in 2012, targeting natural gas “sweetening units,” equipment leaks at natural gas processing plants, and establishing new VOC standards for certain oil and natural gas operations. However, the 2012 NSPS did not cover hydraulically fractured oil wells and

other equipment in the oil and gas industry that is targeted in the 2016 NSPS.

4. Primary goal to limit methane emissions.
 - a) Focus on the following operations: crude petroleum and natural gas extraction, natural gas liquid extraction, natural gas distribution, pipeline distribution of crude oil, and pipeline transportation of natural gas.
 - b) Encourage use of Best System of Emissions Reduction (“BSER”) equipment and processes.

B. Requirements for Natural Gas Operations

1. Processes and Equipment at Natural Gas Well Sites.
 - a) Owners and operators must utilize optical gas imaging (“OGI”) to detect leaks twice per year, with goal of controlling fugitive methane and VOC emissions.
 - (1) Initial survey to take place within 60 days of rule being published in Federal Register or within 60 days of startup of production, whichever is later.
 - (2) OGI survey to include cover valves, connectors, pressure-relief devices, open ended lines, flanges, closed vent systems, compressors and thief hatches on controlled storage tanks.
 - (3) Leaks must be repaired within 30 days, unless repair would require stopping production. In that case, leak would either need to be repaired within two years, or the next time the site stopped production.
 - (4) Intentional venting does not qualify as leak.
 - (5) Alternative to OGI may include “Method 21” portable VOC monitoring; or use of emerging technology. If owner/operator utilizes emerging alternative leak-monitoring technology, EPA requires submittal of demonstration that the utilized technology can achieve emissions reductions equivalent to OGI or Method 21.
 - b) New processes for pneumatic pumps must be utilized.

- (1) Well sites lacking electricity generally utilize pneumatic pumps to drive fluids.
- (2) Emissions from new, modified and reconstructed natural gas-driven diaphragm pumps must be reduced 95% if there is a control device on site or there is the ability to route to recapture.
- (3) Not required if there is already a control process that has equivalent emissions reduction, or if it would be technically infeasible to route methane and VOCs to an existing control device.
- (4) Limited-use pneumatic pumps that operate for less than 90 days are exempt, as are lean glycol circulation pumps and natural gas-driven piston pumps.
- (5) Rule also exempts use of solar-powered, electric-powered, and air-powered pumps to encourage their use.

2. Requirements for Processes and Equipment at Natural Gas Production and Gathering Boosting Stations.

- a) Owners and operators must utilize optical gas imaging (“OGI”) to detect leaks twice per year, with goal of controlling fugitive methane and VOC emissions.
- b) Initial survey to take place within 60 days of rule being published in Federal Register or within 60 days of startup of production, whichever is later.
- c) OGI survey to include cover valves, connectors, pressure-relief devices, open ended lines, flanges, closed vent systems, compressors and thief hatches on controlled storage tanks.
- d) Leaks must be repaired within 30 days, unless repair would require stopping production. In that case, leak would either need to be repaired within two years, or the next time the site stopped production.
- e) Intentional venting does not qualify as leak.
- f) Alternative to OGI may include “Method 21” portable VOC monitoring; or use of emerging technology. If owner/operator utilizes emerging alternative leak-monitoring technology, EPA

requires submittal of demonstration that the utilized technology can achieve emissions reductions equivalent to OGI or Method 21.

3. Requirements for Processes and Equipment and Natural Gas Processing Plants.

- a) Zero emissions limit for natural-gas driven diaphragm pumps at natural gas processing plants.
 - (1) EPA considers electricity to be widely available at these plants to power pumps.
 - (2) Solar-powered and electricity driven pumps, as well as natural gas-driven piston pumps, are not subject to this rule.
 - (3) Owners and operators are required to notify the EPA in their next annual report when they construct, modify, or reconstruct pneumatic diaphragm pumps subject to the rule.
- b) Emissions regulations adopted in 2012 for VOC emissions are adopted and applied to methane.

4. Requirements for Equipment at Natural Gas Transmission Compressor Stations.

- a) Centrifugal compressor stations utilizing wet seals; i.e. use oil as a barrier to keep gas from escaping, must reduce methane and VOC emissions by 95% by flaring or routing captured gas to a process.
 - (1) EPA encourages use of centrifugal compressors using dry seals.
 - (2) These are exempt from NSPS.
- b) Rods in reciprocating compressors must be replaced on or before 26,000 hours of operation where hours are monitored and documented; or every 36 months, where hours are not monitored and documented.
- c) Recordkeeping and annual reporting requirements.
- d) Bleed limits on pneumatic controllers must be limited to six standard cubic feet of gas per hour.

- (1) Pneumatic controllers often powered by high-pressure natural gas, and can release gas with valve movements and in normal operation.
 - (2) Low-bleed controllers, defined as less than six cubic feet of gas per hour or less, are not subject to the NSPS.
 - (3) High-bleed controllers required for certain operational and safety requirements exempt.
- e) Owners and operators must utilize optical gas imaging (“OGI”) to detect leaks twice per year, with goal of controlling fugitive methane and VOC emissions.
- (1) Initial survey to take place within 60 days of rule being published in Federal Register or within 60 days of startup of production, whichever is later.
 - (2) OGI survey to include cover valves, connectors, pressure-relief devices, open ended lines, flanges, closed vent systems, compressors and thief hatches on controlled storage tanks.
 - (3) Leaks must be repaired within 30 days, unless repair would require stopping production. In that case, leak would either need to be repaired within two years, or the next time the site stopped production.
 - (4) Intentional venting does not qualify as leak.
 - (5) Alternative to OGI may include “Method 21” portable VOC monitoring; or use of emerging technology. If owner/operator utilizes emerging alternative leak-monitoring technology, EPA requires submittal of demonstration that the utilized technology can achieve emissions reductions equivalent to OGI or Method 21.

C. Requirements for Oil Operations

- 1. Owners and operators of hydraulically fractured oil wells must capture natural gas that escapes into air during “flowback.”
 - a) Flowback is period of a well completion as consisting of two distinct stages, the ‘initial flowback stage’ and the ‘separation flowback stage.’

- (1) The initial flowback stage begins with the onset of flowback and ends when the flowback is routed to a separator.
 - (2) Routing of the flowback to a separator is required as soon as a separator is able to function (i.e., the operator must route the flowback to a separator unless it is technically infeasible for a separator to function). Any gas in the flowback prior to the point at which a separator begins functioning is not subject to control. The point at which the separator can function marks the beginning of the separation flowback stage.
- b) Emissions must be reduced by 95%, through Reduced Emissions Completion (“REC”), also referred to as “Green Completion.”
- (1) In green completion, special equipment separates gas and liquid hydrocarbons from the flowback that comes from the well as it is being prepared for production, allowing the gas and hydrocarbons to be treated and used or sold. All salable gas must be routed from the separator to a flow line or collection system, re-injected into the well or another well, used as an onsite fuel source, or used for another purpose that a purchased fuel or raw material would serve. If this is not feasible, the leftover gas must be combusted. All liquids must be routed to a storage vessel or well completion vessel, collection system, or be re-injected into the well or another well. This limits the waste of nonrenewable sources and produces more revenue. Owners and operators must have a separator on site during the entire well completion process for development wells.
 - (2) Green Completion must begin within six months after publication of NSPS in Federal Register.
 - (a) Prior to that time, must utilize combustion controls to reduce emissions.
 - (b) Intended to allow phase-in period for Green Completion personnel and equipment.
 - (3) Several exceptions.
 - (a) No Green Completion requirements for new exploratory (wildcat) wells, delineation wells, or

low-pressure wells, and not required to have a separator onsite.

- (b) Option of either routing all flowback to a completion combustion device with a continuous pilot flame or to route all flowback into one or more well completion vessel and commence operation of a separator unless it is technically infeasible for a separator to function.
- (c) Any gas that is present in the flowback before the separator is not subject to this control.
- (d) Combustion is not required in conditions that may result in a fire hazard or explosion, or where high heat emissions from a completion combustion device may negatively impact tundra, permafrost, or waterways.

2. Must use OGI to detect leak surveying twice a year.

- a) Initial survey to occur within one year of the new rule being published in the Federal Register or within 60 days of the startup of production, whichever is later.
- b) Survey must cover valves, connectors, pressure-relief devices, open ended lines, flanges, closed vent systems, compressors and thief hatches on controlled storage tanks.
- c) Any leaks found must be repaired within 30 days, unless the repair would require shutting down production, in which case the owners or operators must complete the repair within two years or at next shut down.
- d) Intentional venting does not qualify as a leak.
- e) Owners and operators may use “Method 21” as an alternative to OGI, or emerging alternative leak monitoring technology. If alternative technology is used, information must be submitted to demonstrate that using the alternative technology is capable of achieving methane and VOC reductions equivalent to those achieved by OGI or Method 21.
- f) Low production well sites (those with an average combined oil and natural gas production of less than 15 barrels of oil equivalent per

well per day) are not exempt as their emissions are equivalent to higher production sites.

3. New processes for pneumatic pumps must be utilized.
 - a) Owners and operators must route methane and VOC emissions from pumps to an on-site control device, which could reduce emissions by 95%.
 - b) Not required if there is already a control process that has equivalent emissions reduction, or if it would be technically infeasible to route methane and VOCs to an existing control device.
 - c) Limited-use pneumatic pumps that operate for less than 90 days are exempt, as are lean glycol circulation pumps and natural gas-drive piston pumps.
 - d) Rule also exempts use of solar-powered, electric-powered, and air-powered pumps to encourage their use.

D. Projected Financial Impacts

1. EPA estimates that total annualized engineering costs of the 2016 NSPS will be \$390 million in 2020 and \$640 million in 2025.
 - a) Includes capital, operating, maintenance, monitoring, reporting, and recordkeeping costs.
 - b) Projected costs of purchase of new and updated equipment, new testing, new employees to maintain monitoring and recordkeeping.
2. EPA projects that the oil and natural gas industry will benefit from increasing the capture and repurposing of previously wasted natural gas.
 - a) EPA estimates that this will result in \$70 million in additional revenue through 2020.
 - b) Additional \$110 million in revenue through 2025.

E. Control Technique Guidelines

1. EPA has released (but not finalized) Control Technique Guidelines (“CTGs”) to regulate VOC emissions – will have the added effect of reducing methane emissions.

2. Will be applicable in ozone nonattainment areas and the Ozone Transport Region (“OTR”).
 - a) OTR comprised of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, the District of Columbia, and Northern Virginia.
 - b) Additional states may be added, including Illinois, Indiana, Kentucky, Michigan, North Carolina, Ohio, Tennessee, Virginia, and West Virginia.
3. CTGs are guidance documents.
 - a) Will trigger a requirement for States to develop rules that utilize reasonably available control technology (“RACT”) requirements for covered sources under their State Implementation Plan (“SIP”).
 - b) CTGs contain a “presumptive RACT,” which constitutes EPA’s determination as an adequate level of VOC control.
4. States can deviate from the CTG, but EPA approval still required for the SIP.
5. The CTG evaluates RACT control options for emission sources regulated or proposed to be regulated under the NSPS.
6. Draft CTG includes recommended RACT for: Storage vessels, pneumatic controllers, pneumatic pumps, centrifugal and reciprocating compressors, equipment leaks, and fugitive emissions.

F. Information Collection Request

1. EPA has issued a draft ICR, signaling its intent to regulate existing sources of methane emissions in the oil and gas industry.
2. Effort to obtain information across the oil and gas industry on best configuration for equipment and emissions controls; associated costs; and what the installation entails.
3. The ICR will likely seek information related to:
 - a) Facility and site characteristics;
 - b) Baseline control levels;
 - c) Emission reduction technologies and costs;

- d) Equipment currently use and associated operating conditions; and
 - e) Industry challenges with respect to monitoring emissions.
4. Once the ICR is finalized, the industry will be legally required to respond. EPA anticipates that surveys may go out by the Fall of 2016.

G. Source Determination Rule

- 1. EPA issued a final rule clarifying when multiple pieces of equipment and activities in the oil and gas industry must be deemed a single source, for the purpose of determining whether major source permitting programs apply.
- 2. EPA has defined “adjacent” to mean that equipment and activities in the oil and gas sector under common control that are located on the same site, or on sites that share equipment within ¼ mile of one another.
- 3. These adjacent equipment and activities will be considered part of the same source.

III. DEP Proposal

A. Background

- 1. Pennsylvania is the second-largest producer of natural gas in the United States.
- 2. Governor Wolf plans to “expeditiously” pursue new regulations for the oil and gas industry.
- 3. DEP will adopt and enforce all requirements set forth in EPA’s 2016 NSPS and EPA CTGs, when finalized.
- 4. DEP intends to pursue the adoption of additional regulations for existing sources to enhance the EPA requirements, which are only applicable to new and modified sources.

B. DEP’s “four-point approach”

- 1. DEP will develop a new general permit for new unconventional well pad operations.
 - a) Since August 2013, Pennsylvania regulated emissions from unconventional natural gas wells through exemption criteria, Category No. 38.

- (1) The exemption criteria was issued for conventional wells, unconventional wells, wellheads, and other equipment like engines, storage vessels/tanks, flaring activities, and equipment leaks. Currently exempt from permitting requirements if owner/operator meets all applicable requirements.
 - (2) These sources of emissions are exempt from permitting requirements if owners or operators can meet all of the criteria for an exemption, including LDAR inspection requirements for well pads.
 - (3) DEP also issued conditional permit exemption Category No. 33 in August 2013 for Natural Gas Dispensing Facilities.
- b) DEP plans to begin issuing Air Quality General Permits for oil and gas exploration, development, and production facilities including well pads.
- (1) Doing away with the exemption criteria that will instead be replaced by new general permits in August 2016.
 - (2) Will be DEP's first Air Quality General Permit for oil and gas exploration, development, and production facilities (including well pads).
- c) DEP intends to create BAT requirements at unconventional sources including dehydrators, engines, and turbines for compressor engines at well pads, pigging operations, liquid unloading venting, gas-processing units, storage tanks, and truck load-outs. Intent is to be the leading regulation in the country for controlling emissions.
2. DEP will revise its current general permit (GP-5).
- a) GP-5 is a general permit for non-major sources and establishes BAT requirements for reducing emissions from new sources and requires periodic inspection.
 - b) GP-5 also contains a Leak Detection and Repair (LDAR) program, performance testing, and recordkeeping and reporting obligations for affected owners and operators of non-major sources. LDAR is currently performed through audible, visual, and odor detection methods for mid-stream gathering and compression facilities every month.

- c) DEP plans to strengthen these existing standards (“as necessary”) to better reflect the BAT established by the 2016 NSPS.
- 3. DEP will develop a regulation for existing sources to be considered by the Environmental Quality Board (“EQB”).
 - a) DEP plans to pursue the adoption of regulation for existing sources that is meant to enhance the 2016 NSPS for each source category and process in the oil and natural gas sector.
 - b) DEP states it will present this plan to the EQB within two years.
 - c) More stringent than the 2016 NSPS plan that focuses only on new and modified sources.
- 4. DEP will establish best management practices, including leak detection and repair programs to reduce emissions along production, gathering, transmission, and distribution lines.”
 - a) DEP does not currently require methane monitoring, leak detection, and measures to control and prevent fugitive emissions from pipelines.
 - b) The Pennsylvania Pipeline Infrastructure Task Force and DEP intend to establish best practices for monitoring and LDAR for preventing and controlling fugitive emissions through transmission and distribution pipelines.

C. Projected Financial Impacts

- 1. No solid numbers, but there are worries that additional permitting procedures will increase the cost and time necessary to develop new wells in a market that has already dropped in recent years.
- 2. Worry that Pennsylvania will be less able to compete with other oil and gas markets like Ohio and West Virginia.
- 3. DEP has taken position, similar to EPA, that oil and gas companies will benefit from additional revenues of selling gas which previously would have been wasted absent the tightened regulations.