

Client Alert

Latham & Watkins Environment, Land &
Resources Department

EPA Issues First Air Regulations for Hydraulically-Fractured Gas Wells & Associated O&G Development Equipment

On April 17, 2012, the US Environmental Protection Agency (EPA) issued a Final Rule¹ regulating the emission of volatile organic compounds (VOCs) and certain other pollutants² emitted by hydraulic fracturing and certain equipment used in the upstream and midstream sectors of the oil and gas industry. Most prominently, the Rule marks the first time that EPA will regulate air emissions from hydraulic fracturing operations — by mandating significant reductions in VOC emissions through the use of “green completions,” devices that capture, rather than combust, gas that would otherwise escape during well completions — at gas wells that are hydraulically-fractured or refractured after January 1, 2015.

EPA estimates that the Rule will impact more than 11,000 newly-fractured wells and 1,400 refractured wells, reducing VOCs by 190,000 to 290,000 tons per year (tpy), and air toxics by 12,000 to 20,000 tpy. The Rule's performance standards for VOC emissions from wells and other equipment are also expected to reduce methane emissions from the oil and gas industry (which account for nearly 40 percent of all US methane emissions) by 1.0 to 1.7 million tpy. Specifically, the Rule — issued after extensive litigation³ and public comment⁴ — creates new categories and expands existing categories of New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP).

New Source Performance Standards & National Emission Standards for Hazardous Air Pollutants

Sections 111 and 112 of the Clean Air Act authorize EPA to develop technology-based standards for specific new or modified stationary sources (the NSPS) and for major sources⁵ of hazardous air pollutants (the NESHAP) — codified, respectively, at parts 60 and 63 of title 40 of the Code of Federal Regulations. The Rule creates a new NSPS category (subpart OOOO), Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution, and revises certain NESHAP subparts. These new NSPS and NESHAP performance standards contain significant requirements that will impact both the upstream and midstream⁶ oil and gas sectors.⁷

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Impacts on Upstream Sector

- **Hydraulically-Fractured Well Completions:** Hydraulic fracturing is a process that involves injecting fluids (a mixture of mostly water and sand, plus small quantities of treatment chemicals) at high-pressure, often through horizontally-drilled wells, in order to “fracture” rock formations to enable oil or natural gas to travel more easily to production wells. Methane and VOCs can escape to the atmosphere during the period following the hydraulic fracturing when the fracturing fluids flow back to the surface at high velocity, which can last from three to 10 days. Some well operators have begun using portable reduced emissions completion equipment — also called “green completions” — to capture excess natural gas from the wellhead that otherwise would be released into the air or flared off. Sixty days after publication in the Federal Register (expected to occur in May 2012), subpart OOOO mandates a 95 percent reduction in VOC emissions from hydraulically-fractured and refractured gas wells, effective in two phases:
 - **Phase 1:** While the most significant, green completion requirements will not be required until January 1, 2015, prior to that time, well operators must still control the emissions from each “well completion”⁸ following hydraulic fracturing operations. In addition to the green completion process, operators have the option until January 1, 2015 of combusting their well completion emissions.⁹ To incentivize early adoption of the green completion requirements, however, the Rule states that refractured wells will not be considered “modified” under the NSPS program if well operators use green completions rather than flaring to reduce emissions prior to January 1, 2015.¹⁰ Therefore, in many cases, this “incentive” will allow well operators to refracture wells without subjecting the facility to additional state permitting requirements that are typically required for “modified” equipment or facilities under the NSPS.
 - **Phase 2:** After January 1, 2015, at each well completion following hydraulic fracturing at a gas well, well operators must employ green completions — that is, they must route the recovered fluids and gas into storage vessels and gas collection systems/gas flow lines, re-inject them into wells, or use the recovered gas as an on-site fuel source or for “another useful purpose” — all with no direct release to the atmosphere.¹¹ In addition, operators must route “all salable quality gas” to a gas flow line as soon as practicable.¹²
 - **Exceptions for Wildcat, Delineation & Low-Pressure Wells:** Importantly, “wildcat”¹³ wells, delineation wells and low-pressure wells¹⁴ are not required to employ green completions at any point in time; however, 60 days following publication of the Rule, operators of these wells still must combust well completion emissions where practicable.¹⁵

Impacts on Midstream Sector

- **Centrifugal Compressors:** Centrifugal compressors are machines that raise the pressure of natural gas by drawing in low-pressure gas and discharging significantly higher-pressure gas by means of mechanical rotating vanes or impellers. Under subpart OOOO, centrifugal compressors constructed, modified or reconstructed after August 23, 2011 (the date of the Proposed Rule) must reduce VOC emissions by 95 percent or greater through use of a closed-vent system or an enclosed combustion device.¹⁶ Importantly, only centrifugal compressors constructed, modified, or reconstructed after August 23, 2011 that service a single well site and are located between the wellhead and the point of custody transfer to the gas transmission/storage system are subject to the new rule.¹⁷

- **Reciprocating Compressors:** Reciprocating compressors perform the same function as centrifugal compressors, but by means of positive displacement and employing linear movement of the driveshaft. Under subpart OOOO, reciprocating compressors constructed or modified after August 23, 2011 must replace their rod packing either prior to operating for 26,000 hours or prior to 36 months from startup/most recent rod packing replacement.¹⁸ As with centrifugal compressors, only reciprocating compressors constructed, modified or reconstructed after August 23, 2011, servicing a single well site, and located between the wellhead and the point of custody transfer are subject to the new rule.¹⁹
- **Sweetening Units:** Natural gas may contain significant amounts of sulfur (as hydrogen sulfide) and carbon dioxide (rendering it "sour gas"), which untreated makes the gas lethal and extremely corrosive. The process for removing hydrogen sulfide from sour gas is commonly referred to as "sweetening" the gas. If the hydrogen sulfide removed from the sour gas is combusted, sulfur dioxide (SO₂) is emitted. Subpart OOOO sets more stringent SO₂ emission limits on sweetening units constructed or modified after August 23, 2011 at onshore natural gas processing plants.²⁰
- **Equipment Leaks:** The Rule lowers the existing leak definition for valves at onshore natural gas processing plants under NSPS subpart VVa and NESHAP subparts V and HH to 500 parts per million, thus requiring the application of leak detection and repair (LDAR) at this lower detection level.²¹ This revised leak threshold for triggering LDAR requirements may have a significant cost impact on some gas processing facilities.
- **Small Glycol Dehydration Units:** Glycol dehydrators are devices that remove most of the liquid free water associated with extracted natural gas (through the introduction of glycol, an agent with a chemical affinity for water). The Rule amends two NESHAP subparts:
 - First, the Rule amends subpart HH, Oil and Natural Gas Production Facilities, to include "small" glycol dehydration units as a covered source — defined as units with an actual annual average gas flowrate less than 85,000 standard cubic meters per day (scmd) or actual annual average benzene emissions less than 0.90 megagrams per year (Mg/yr) — which had been previously exempt. Thus, each small glycol dehydrator, located at a major source, constructed before August 23, 2011 must achieve compliance with the new maximum available control technology (MACT) emission limits for benzene, ethylbenzene, toluene and xylene (BTEX) within three years and 60 days after publication of the Rule in the Federal Register. Those constructed after August 23, 2011 must achieve compliance immediately upon startup, or 60 days after publication in the Federal Register, whichever is later.
 - Second, the Rule amends subpart HHH, Natural Gas Transmission and Storage Facilities, to also cover "small" glycol dehydration units — defined, in the case of units located at gas transmission and storage facilities that are major sources, as units with an actual annual average gas flowrate less than 283,000 scmd or actual annual average benzene emissions less than 0.90 Mg/yr.
- **Storage Vessels:**²⁶ Single storage vessels built, modified, or reconstructed after August 23, 2011 that have emissions equal to or greater than 6 tpy must begin to comply with new VOC reduction requirements no later than one year after publication in the Federal Register.²⁷ Following that compliance date, qualifying storage vessels must reduce VOC emissions by at least 95 percent within 60 days of startup at well sites with no other wells in production,²⁸ and upon startup at well sites with one or more wells already in production.²⁹ However, the Rule does not apply to storage vessels already in compliance with certain other NSPS and NESHAP standards.³⁰

- **Pneumatic Controllers:** Pneumatic controllers are automated instruments used for maintaining gas production variables, such as liquid levels, pressure and temperature. Most pneumatic controllers in the gas industry are powered by gas and can be designed to discharge (or bleed) methane to the atmosphere as a part of normal operations. Subpart OOOO sets several emission limits for pneumatic controllers:
 - Continuous-bleed, gas-driven controllers with a bleed rate of 6 standard cubic feet per hour (scfh) located at a gas processing facility, and constructed after August 23, 2011, must reduce their bleed rate to zero.³¹
 - Controllers constructed or modified at a location between the wellhead and a gas processing plant one year after publication of the Rule in the Federal Register must have a bleed rate less than or equal to 6 scfh.³²
 - Importantly, pneumatic controllers do not have to meet the above limits where the operator determines that the use of a controller with a greater than 6 scfh bleed rate is “required based on functional needs, including but not limited to response time, safety and positive actuation.”³³ Controllers with a bleed rate of less than 6 scfh and controllers at natural gas transmission, storage and distribution segments are not covered by the Rule.

Implications for Industry

EPA estimates the cost to industry of compliance to be approximately \$170 million per year. However, EPA also estimates that the Rule will generate \$11 to \$19 million per year in savings for the industry as a result of the value of the natural gas and condensate that will be recovered once the Rule is in full effect. EPA also values the expected reduction in methane emissions at \$440 million annually. In what it calls a major concession to industry, EPA is phasing in the Rule’s most controversial requirement (*i.e.*, the green completion requirements) over the next two-and-a-half years. In contrast, most of the Rule’s other requirements go into effect almost immediately. The ultimate costs of the Rule will likely depend on whether the Rule’s phase-in period will provide enough time for a market in green completion equipment and services to develop that is sufficiently large that well operators do not experience price spikes and equipment shortages.

Notably, although the Rule does not regulate methane directly, there are indications that methane — a potent greenhouse gas — may have been the true target of the new regulations. This might explain why EPA declined to grant any exemptions from green completion requirements for wells with demonstrated low or *de minimis* VOC emissions. EPA claimed that, given VOC variability among gas wells, such an exemption would be “inappropriate” due to implementation concerns.³⁴ In addition, EPA has noted in its response to comments for the Rule that it intends “to continue to evaluate the appropriateness of regulating methane with an eye toward taking additional steps if appropriate.”³⁵

Thus, the Rule is likely a harbinger of further greenhouse gas regulation of the upstream and midstream oil and gas industry. Additionally, the Rule may reflect EPA’s increasing scrutiny of hydraulic fracturing as EPA continues to assess the scope of its statutory authority to regulate hydraulic fracturing under the Safe Drinking Water Act’s Underground Injection Control program.³⁶ Therefore, as the oil and gas industry begins to comply with this Rule and the greenhouse gas reporting rule issued by EPA in November 2010, companies should closely evaluate their greenhouse gas emissions and hydraulic fracturing operations for likely regulatory targets and be prepared to engage in future rulemaking processes.

Endnotes

- ¹ Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews, U.S. Environmental Protection Agency (Apr. 17, 2012) (expected to be published in the Federal Register in May 2012) (hereinafter, Rule), <http://www.epa.gov/airquality/oilandgas/pdfs/20120417finalrule.pdf>.
- ² The Rule sets emission standards for sulfur dioxide (SO₂) and air toxics (*i.e.* benzene, toluene, ethylbenzene, and xylene). The Rule is also anticipated to reduce methane emissions.
- ³ EPA is required by statute to review the NSPS and NESHAP performance standards “at least every 8 years and, if appropriate, revise” the standards. See 42 U.S.C. §§ 7411(b)(1)(B) & 7412(d)(6). WildEarth Guardians and the San Juan Citizens Alliance sued EPA in January 2009 for the agency’s alleged failure to review the NSPS and NESHAPs within the required time period. *WildEarth Guardians v. Jackson*, D.D.C., No. 09-89, *stipulation filed* Apr. 2, 2012. EPA and the plaintiffs reached an agreement, memorialized by a consent order issued in February 2010 by the U.S. District Court for the District of Columbia, requiring EPA to conduct a review of the existing performance standards and update if necessary.
- ⁴ The proposed Rule was issued on July 28, 2011 and published in the Federal Register on August 23, 2011. See Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutant Reviews, 76 Fed. Reg. 163 (August 23, 2011). EPA received more than 156,000 comments on the Proposed Rule and held three public meetings.
- ⁵ Any source that has the potential to emit 10 tpy of a single hazardous air pollutant (HAP) or 25 tpy of any combination of HAPs.
- ⁶ Though the equipment specific emission standards primarily impact midstream industry, some of the equipment (*e.g.*, pneumatic controllers) are used by well service providers.
- ⁷ It is important to note that the Rule does not have any direct effect on most oil wells, only on certain related equipment – for example, storage vessels. See, *e.g.*, Rule, p. 282 (to be codified at 40 CFR § 60.5365(e)) (“Each storage vessel facility, which is a single storage vessel, located in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment.”).
- ⁸ “The process that allows for the flowback of petroleum or natural gas from newly-drilled wells to expel drilling and reservoir fluids and tests the reservoir flow characteristics, which may vent produced hydrocarbons to the atmosphere via an open pit or tank.” Rule, p. 414 (to be codified at 40 CFR § 60.5430).
- ⁹ See Rule, p. 286 (to be codified at 40 CFR § 60.5375(a)(3)).
- ¹⁰ See Rule, pp. 157 & 284-87 (to be codified at 40 CFR § 60.5365(h)(1)) (“A gas well facility that conducts a well completion operation following hydraulic fracturing is not an affected facility, provided that the requirements of § 60.5375 [green completions] are met.”).
- ¹¹ See Rule, pp. 285-86 (to be codified at 40 CFR § 60.5375(a)(1)).
- ¹² See Rule, p. 286 (to be codified at 40 CFR § 60.5375(a)(2)).
- ¹³ “Wells outside known fields or the first well drilled in an oil or gas field where no other oil and gas production exists.” Rule, p. 415 (to be codified at 40 CFR § 60.5430).
- ¹⁴ “A well with reservoir pressure and vertical well depth such that 0.445 times the reservoir pressure (in psia) minus 0.038 times the vertical well depth (in feet) minus 67.578 psia is less than the flow line pressure at the sales meter.” Rule, p. 408 (to be codified at 40 CFR § 60.5430).
- ¹⁵ See Rule, pp. 287-88 (to be codified at 40 CFR § 60.5375(f)).
- ¹⁶ See Rule, pp. 281, 288-89 (to be codified at 40 CFR §§ 60.5365(b) & 60.5380).
- ¹⁷ See Rule, p. 281 (to be codified at 40 CFR § 60.5365(b)).
- ¹⁸ See Rule, pp. 289-90 (to be codified at 40 CFR §§ 60.5365(c) & 60.5385).
- ¹⁹ See Rule, p. 281 (to be codified at 40 CFR § 60.5365(c)).
- ²⁰ See Rule, p. 301 (to be codified at 40 CFR § 60.5405).
- ²¹ See Rule, pp. 64 & 297 (to be codified at 40 CFR § 60.5401(b)(2)); Rule, pp. 440-41 (to be codified at 40 CFR § 63.769(c)).
- ²² See Rule, pp. 422 & 429 (to be codified at 40 CFR §§ 63.760(b)(1)(i) & 63.761).

²³ See Rule, p. 424 (to be codified at 40 CFR § 63.760(f)(7)).

²⁴ See Rule, pp. 424-25 (to be codified at 40 CFR § 63.760(f)(8)).

²⁵ See Rule, pp. 508 & 513 (to be codified at 40 CFR §§ 63.1270(b) & 63.1271).

²⁶ These storage vessel requirements may also have an impact on well service providers, in addition to midstream companies.

²⁷ See Rule, p. 293 (to be codified at 40 CFR § 60.5395).

²⁸ See Rule, p. 293 (to be codified at 40 CFR § 60.5395(a)).

²⁹ See Rule, p. 294 (to be codified at 40 CFR § 60.5395(b)).

³⁰ See Rule, p. 295 (to be codified at 40 CFR § 60.5395(d)) (NSPS subpart Kb, and NESHAP subparts G, CC, HH, WW, and HHH).

³¹ See Rule, p. 291 (to be codified at 40 CFR § 60.5390(b)(1)).

³² See Rule, pp. 291-92 (to be codified at 40 CFR § 60.5390(c)(1)).

³³ See Rule, p. 291 (to be codified at 40 CFR § 60.5390(a)).

³⁴ See Rule, pp. 139-41.

³⁵ Rule, p. 128.

³⁶ The UIC program regulates the underground injection of fluids for storage or disposal. Under the SDWA, EPA sets minimum standards that each state must implement through its own UIC program. Congress, however, specifically excluded hydraulic fracturing — except for the underground injection of “diesel fuels” — from regulation under the UIC program in the 2005 Energy Policy Act, leaving hydraulic fracturing largely exempt from federal regulation and, instead, subject mostly to oversight by state, local and inter-state authorities.

If you have any questions about this *Client Alert*, please contact one of the authors listed below or the Latham attorney with whom you normally consult:

Joel H. Mack

+1.713.546.7438
joel.mack@lw.com
Houston

Sara K. Orr

+1.202.637.2364
sara.orr@lw.com
Washington, D.C.

Davon M. Collins

+1.212.906.1799
davon.collins@lw.com
New York

Benjamin M. Lawless

+1.202.637.2170
ben.lawless@lw.com
Washington, D.C.

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