Reducing Air Pollution from the Oil and Natural Gas Industry

EPA's Final New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants

April 17, 2012

Today's Action

- Updates standards issued in 1985 and 1999
- Continues growth in clean domestic energy production, while increasing environmental protection
- Relies on available, affordable technology already in use
- Offsets the cost of pollution controls through the capture of emissions
- Provides flexibility and transparency

> "[*I*]*t is vital that we take full advantage of our natural gas resources, while giving American families and communities confidence that natural and cultural resources, air and water quality, and public health and safety will not be compromised.*"
>
> *Executive Order Supporting Safe and Responsible Development of Unconventional Domestic Natural Gas Resources signed by President Obama on April 13, 2012*

Overview of Action

- On April 17, 2012, EPA issued rules that will ensure that domestic natural gas production can continue to grow in an environmentally responsible manner.
- A key feature of these rules will require companies to capture natural gas that escapes when hydraulically fractured gas wells are prepared for production -- gas that currently is going to waste in many areas.
- The rules are cost-effective: projected revenues from recovered natural gas are expected to offset costs, yielding a cost savings of $11 million to $19 million in 2015.
- EPA made a number of changes to the rules in response to public comment.
- The final rules provide flexibility while maintaining environmental benefits . They provide a phase-in period -- which ensures that equipment to capture natural gas is available in time to meet compliance deadlines – and set key requirements based on performance rather than on a specific technology.
- The rules also include incentives for industry to modernize equipment and reduce pollution early.
- The rules will reduce emissions of smog-forming volatile organic compounds (VOCs). These reductions are expected to help reduce ozone in areas where natural gas production occurs. The rules will also reduce emissions of air toxics. Air toxics are known or suspected to cause cancer and other serious health problems.
  - The rules will also yield co-benefits by reducing methane from natural gas wells. Methane is a potent greenhouse gas – more than 20 times as potent as carbon dioxide.

The Natural Gas Production Industry

Natural gas systems encompass wells, gas gathering and processing facilities, storage, and transmission and distribution pipelines.

Production & Processing

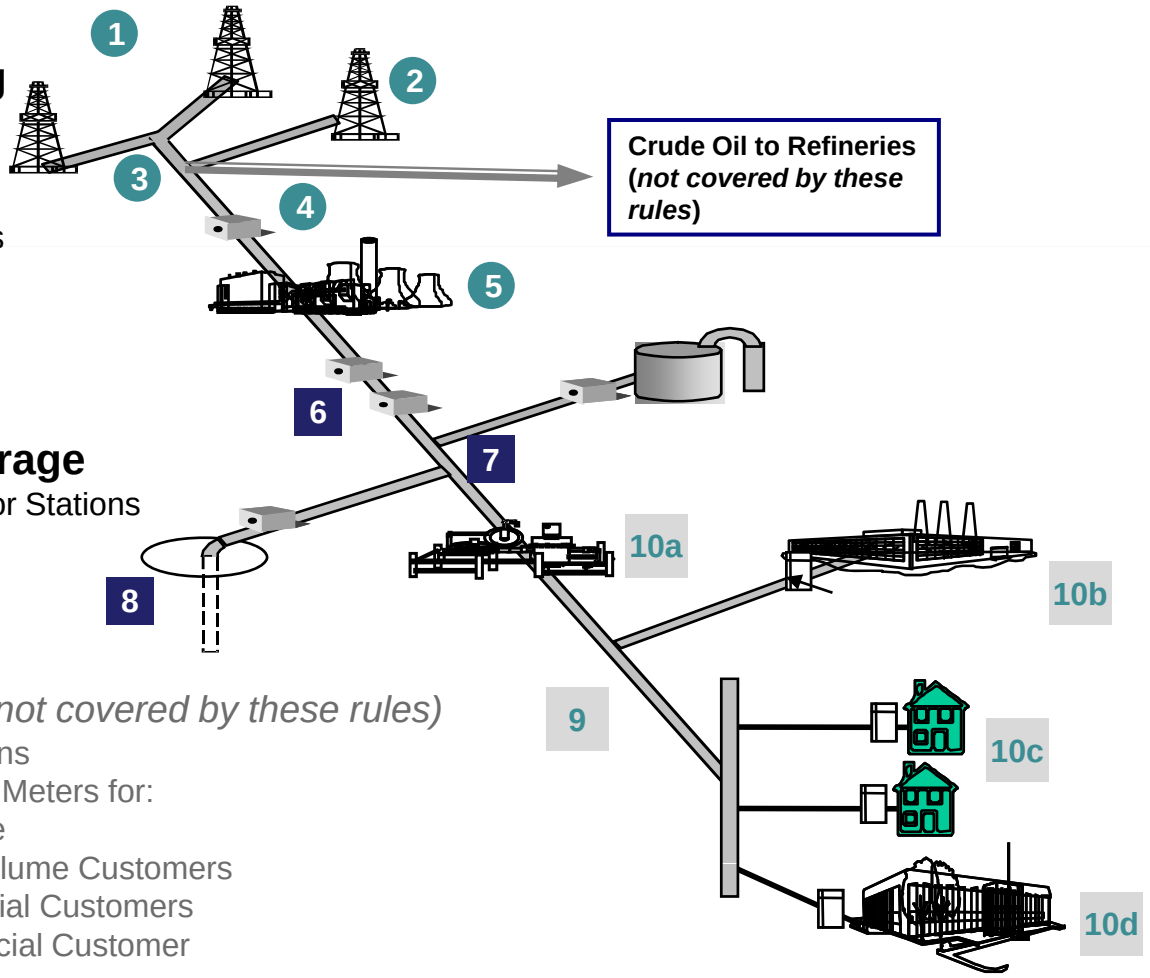
1. Drilling and Well Completion
2. Producing Wells
3. Gathering Lines
4. Gathering and Boosting Stations
5. Gas Processing Plant

Natural Gas Transmission & Storage

6. Transmission Compressor Stations
7. Transmission Pipeline
8. Underground Storage

Distribution *(not covered by these rules)*

9. Distribution Mains
10. Regulators and Meters for:
    a. City Gate
    b. Large Volume Customers
    c. Residential Customers
    d. Commercial Customer



Source: Adapted from American Gas Association and EPA Natural Gas STAR Program

Pollutants Emitted by the Oil and Natural Gas Industry Are a Health & Environmental Concern

- VOCs are one of the key ingredients in forming ozone (smog).
  - The oil and gas industry is the largest industrial source of VOC emissions in the U.S., based on data reported to the 2008 National Emissions Inventory.
  - Ozone is linked to asthma attacks, hospital and emergency department visits, and increased school absences, among other serious health effects.
  - Ozone used to be considered a summertime pollutant; but recently has become a problem in winter in some areas where significant natural gas production occurs.
  - In some areas, VOCs also help form fine particle pollution ($PM2._5$).
- Air toxics can cause cancer and other serious, irreversible health effects, such as neurological problems and birth defects.
- Methane reacts in the air to form ground-level ozone.

Source: 2008 NEI v2 http://www.epa.gov/ttn/chief/net/2008inventory.html

Clean Air Act Requirements

- The Clean Air Act requires EPA to set **new source performance standards** (NSPS) for industrial categories that cause, or significantly contribute to, air pollution that may endanger public health or welfare.
  - Each performance standard must be based on the "best system of emission reduction."
  - The law requires EPA to review and, if appropriate, revise new source performance standards every eight years.
  - EPA issued its two existing NSPS for the oil and gas industry in 1985.
- The Clean Air Act also requires EPA to set **standards for air toxics**, which are known or suspected to cause cancer and other serious health effects.
  - EPA must review these standards eight years after they are issued, to determine whether additional changes are necessary to reduce risk
  - EPA must review and revise as necessary these standards eight years after they are issued, to reflect better emission control practices, processes or technologies that have become available and are cost-effective
  - EPA's existing air toxics standards for the oil and natural gas industry were issued in 1999.
- EPA issued today's rules under a court deadline.

Reducing Pollution from Well Completions

- Today's rules **will reduce pollution** from natural gas wells that are hydraulically fractured**, without slowing production.**
- The rules **phase in requirements for capturing natural gas.** This phase-in provides time for equipment to be manufactured and operators to be trained to capture gas through a process known as a "green completion."
- Industry leaders already are using green completions as a smart business practice.
- Owners/operators of fractured and refractured wells may reduce pollution through flaring until Jan. 1, 2015; after that, gas capture is required.
- Wells that are refractured will not be considered affected facilities if they use green completions and meet recordkeeping/reporting requirements as of the effective date of the rule.
- Exploratory, delineation and low-pressure wells are exempt from green completion requirements; will have to flare.
- EPA streamlined **well completion notification and reporting requirements** to reduce burden to industry and states, while ensuring transparency and accountability.

Example of Green Completion Equipment (Source: Weatherford)

A natural gas well site. EPA photo.

Key Changes Since Proposal

Based on comments received during the public comment period, the final rule:

- Includes an updated definition for a “green completion”
  - Changed to focus on performance rather than technology, allowing greater flexibility, lowering costs and reducing the burden on equipment manufacturing and distribution.
- Eliminates state permitting “trigger” when wells are refractured if operators choose to use green completions (instead of flaring)
  - Refractured wells that use green completions will not be considered affected facilities. These wells will not trigger minor source permitting requirements in some states.
  - Refractured wells may choose to flare for now and phase in green completions by Jan. 1, 2015. These wells will be considered affected facilities for permitting purposes.
- Does not finalize requirements for compressors and pneumatic controllers in the transmission segment of this industry
  - Based on public comment, the agency concluded it needed additional information in order to set cost-effective standards for compressors and controllers in this segment, where VOC content of the gas generally is low.

Additional Requirements to Reduce Pollution

Today's rules also set requirements for several types of equipment that may vent or leak VOCs or air toxics.

Storage tanks

- EPA is phasing in requirements to reduce VOC emissions from new & modified tanks over one year, to ensure enough combustion devices are available to reduce the emissions.
- Requirement applies to both oil and natural gas production.
- EPA did not change air toxics standards for storage tanks; however emissions storage tanks in natural gas production sector will be counted toward determining a major source under the air toxics standards for oil & natural gas production.

Centrifugal compressors

- VOC reduction required for compressors with wet seal systems only; requirements do not apply in the natural gas transmission and storage segments, where VOC emissions generally are low.

Reciprocating compressors

- Rule requires replacement of rod packing, which can leak VOCs as it wears.
- Rule provides an alternative schedule for rod packing replacement that does not require monitoring and documentation of operating hours.

A combustion device and storage tanks. EPA photo

Additional Requirements, cont.

Pneumatic controllers

- Used to regulate conditions such as pressure and temperature.
- Rule affects high-bleed controllers, allows use only for critical applications, such as emergency shutoff valves.
- Requirements apply to controllers used in both oil and gas sectors; (in natural gas sector, applies only to sources upstream of the transmission line).

Glycol dehydrators

- Covered under two air toxics standards (oil and natural gas production; natural gas processing plants)
- Both standards retain existing standards for large dehydrators at major sources, set new standards for small dehydrators (not “area sources.”)

Glycol dehydrators at a well production pad. EPA photo

Leaks from valves at gas processing plants

- Strengthened requirements for detection and repair for VOCs and air toxics.

Sweetening units at natural gas processing plants

- Must reduce sulfur dioxide emissions by 99 percent

Cost Savings and Emissions Reductions

- The rules will yield a cost savings of **$11 to $19 million** in 2015, because the value of natural gas and condensate that will be recovered and sold will offset costs.

- EPA estimates the following combined annual emission reductions when the rules are fully implemented :
  - VOCs: 190,000 to 290,000 tons
  - Air toxics: 12,000 to 20,000 tons
  - Methane: 1.0 to 1.7 million short tons (about 19 to 33 million tonnes of CO_2 equivalent (CO_2 e)

Today's Rules Respond to Public Comment

- EPA sought, and received, extensive public comment during the development of today's final rules. The agency:
  - Held two public meetings while developing the proposal,
  - Held three public hearings on the proposed rule
  - Received more than 156,000 written comments.

- Today's action responds to a number of those comments, in order to ensure the requirements of the rule are cost effective and allow continued, responsible growth in natural gas production.

For Additional Information

- To read more about today's action, visit: www.epa.gov/airquality/oilandgas