

# **2017 Air Regulation Requirements in the Marcellus Utica Region\***

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## **Abstract**

As the calendar turns, the march of new air regulations continues for the oil and gas industry within the Marcellus and Utica basins. During 2017, a number of new air requirements from new permits to GHG reporting methods and fugitive emission testing will impact oil and natural gas production and transmission operations within Ohio, Pennsylvania and West Virginia. It is imperative that operators understand the potential impact of these requirements on their operations, position themselves to reduce the impacts and develop a system to identify and implement/track requirements. This presentation focuses on both federal and state (OH, PA, and WV) proposed and new requirements for 2017, as well as expected trends, including:

- Fugitive leaks testing requirements
- New GHG reporting requirements
- New general permit for well pads and compressor stations
- Pigging emissions
- CTGs
- Electronic reporting
- What to expect from the Trump administration

# 2017 Trends in Air Regulation Requirements in the Marcellus Utica Region

## *Making Sense of the Confusion*

Presented by:  
Thomas S. Seguljic, PE

**Eastern Section AAPG  
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# AGENDA

- EVOLVING LANDSCAPE
- WHAT ARE THE CONCERNS
  - PERMIT APPLICATIONS
  - OPERATING REQUIREMENTS
  - TANK EMISSIONS
  - SUBPART OOOOA STATUS
  - ISSUES ON THE HORIZON
- CLOSING THOUGHTS

Compressor Station Complex

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# EVOLVING LANDSCAPE OF AIR REGULATIONS?

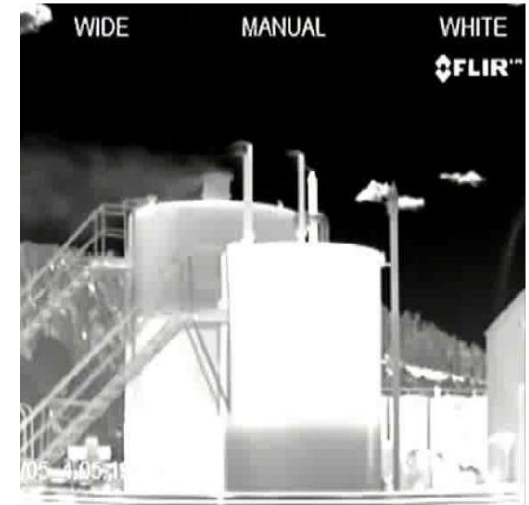


- **Increased scrutiny of Oil & Gas Industry due to:**

- Increased emissions Unconventional vs. Conventional Wells
- Increased activity
- Activity in developed areas

- **Regulatory and Enforcement Activity increasing:**

- Oil & Gas targeted for VOC & GHG Emission Reductions
- Increased EPA & State inspections and violations

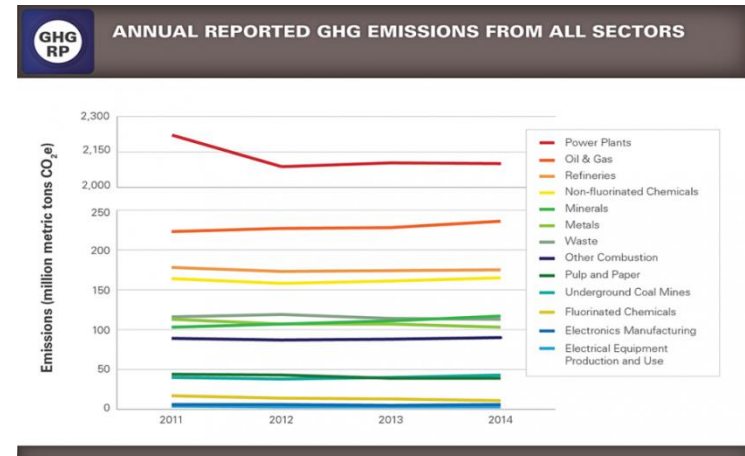
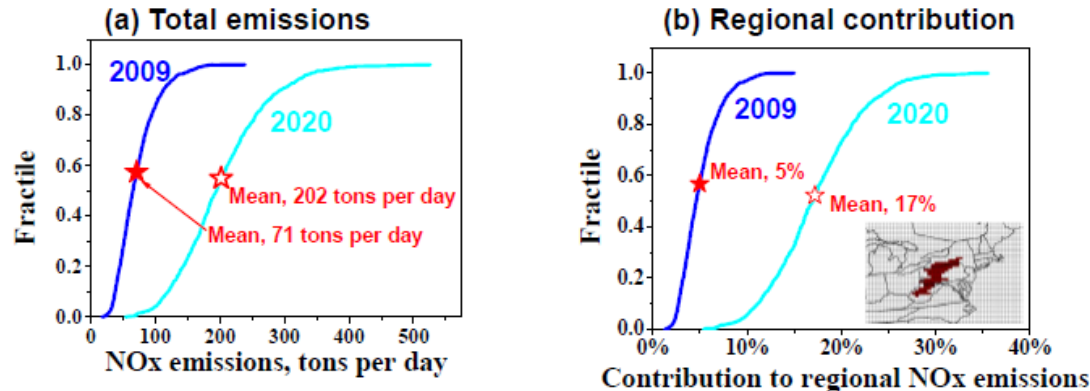




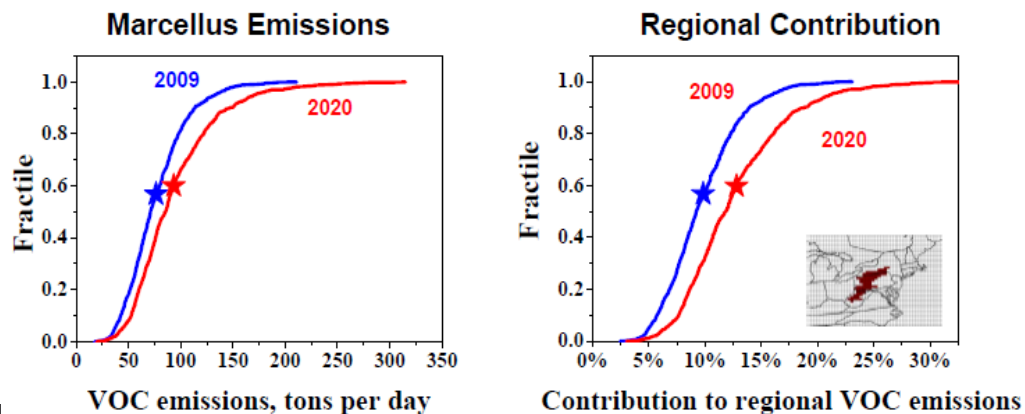
# WHAT ARE THE CONCERNS?



## Marcellus NOx emissions



## Marcellus VOC emissions



Charts provided by: Alllen L. Robinson, "Air pollutant emission from shale gas development and production" Dept. of Mechanical Engineering, Dept. Engineering and Public Policy, Carnegie Mellon University, Pittsburg, PA

# AIR EMISSIONS



## Typical Well Pad Emissions

### Tanks

Wet Gas - Up to 200 TPY VOC

Dry Gas - < 1 TPY VOC

Tanks Loadout - < 1 TPY VOC

GPU - Minimal

Dehydrators (Dry Gas)

< 1 TPY Benzene

Fugitive Leaks - < 1 TPY Methane

< 1 TPY VOC

### Other

Engines - Vary based on size manufacture date and controls

Flare - CO<sub>2</sub>

Pneumatic Devices/Pumps - Varies



## Typical Compressor Station Emissions

Tanks - 20 TPY VOC but varies

Engines - 5-10 TPY NO<sub>x</sub>/ea

0.5-2 TPY/ea Formaldehyde

Dehydrator - < 5TPY/VOC

- < 1TPY Benzene

Pigging - < 5 TPY VOC

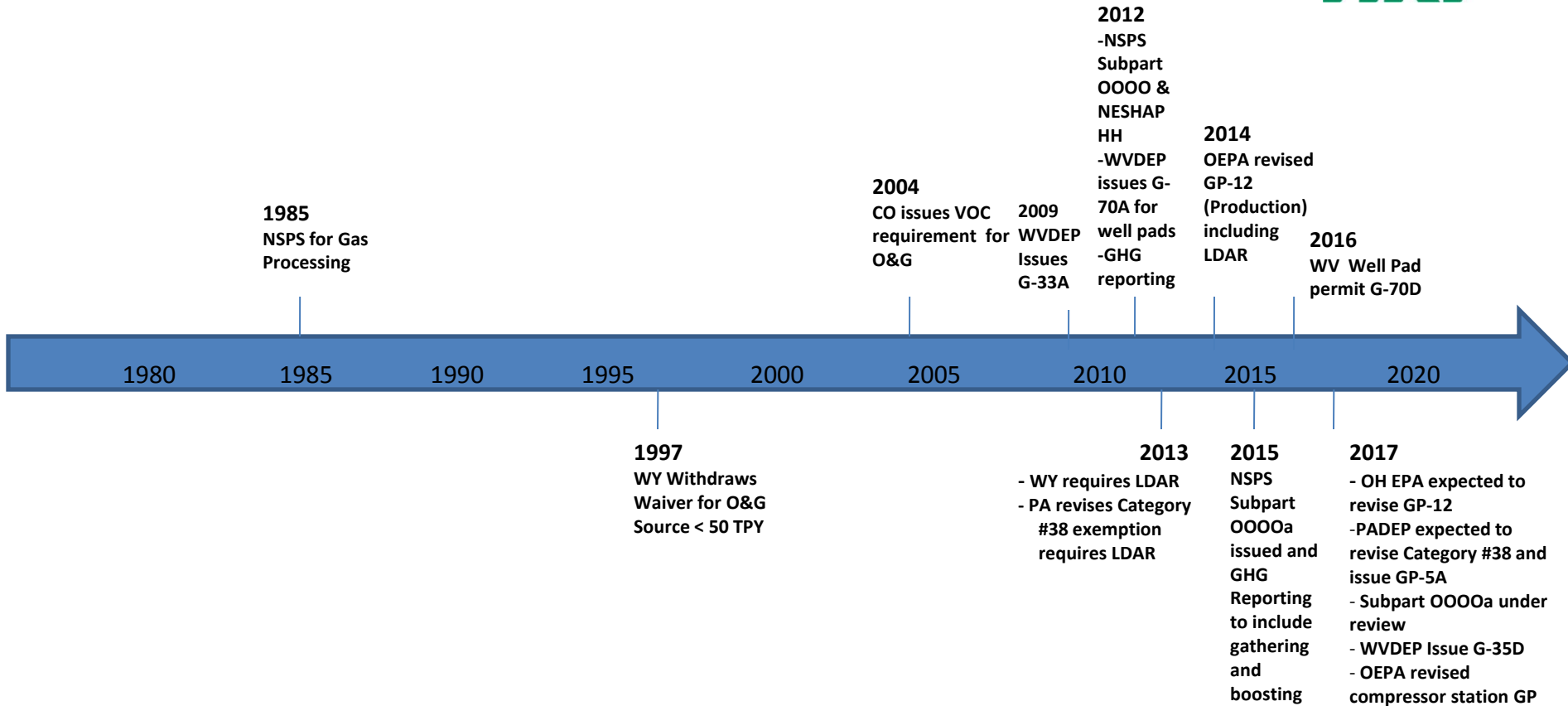
< 50 TPY Methane

Fugitive Leaks - < 1 TPY Methane

< 1 TPY VOC

Pneumatic Devices/Pumps - Varies

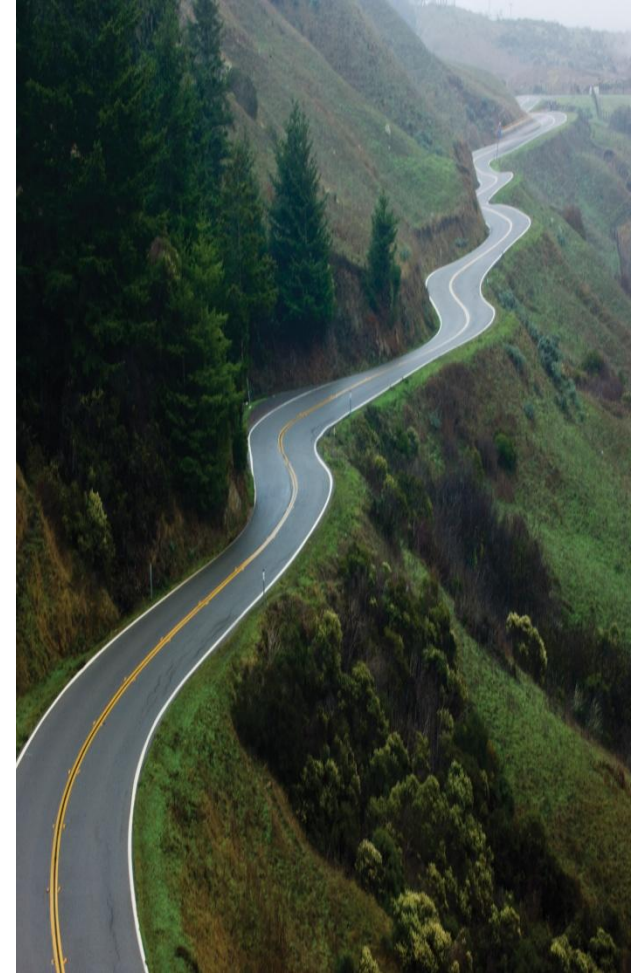
# REGULATORY TIMELINE



# MAKING SENSE OF THE CONFUSION



- Permitting
- Operating Requirements
- Tank Emissions
- Common Violations
- Maintaining Compliance
- On the Horizon
  - Electronic Reporting
  - Pigging
  - Permits





# AIR PERMITS



- General Comments
  - Exemptions for production lifted
  - Clarifying when permit required
  - Incorporating NSPS/NESHAP in permits
  - Increased recordkeeping (i.e. 12 month rolling emissions) and reporting
  - EPA and State staffs getting up to speed
  - Information required for Pigging and Load-out emissions
  - Emission modeling creeping in for Compressor Stations



# AIR PERMITS



## WEST VIRGINIA

Air Permit required prior to installation of emission source if:

- PTE > 6.0 #/hr Criteria Pollutant
- Benzene/Formaldehyde > 1,000 pounds/yr
- Flare used on-site
- Substantive requirement triggered (i.e. LDAR, Tanks)

## Comments

- Applicability for Well Pads dramatically increased since new well construction, hydraulically fractured or re-fractured subject to Subpart OOOOa (substantive requirement)
- Subpart OOOOa review may impact substantive requirements



# AIR PERMITS



## WEST VIRGINIA

- Revised Well Pad and NG Compressor/Dehydration Permits
  - More detailed application
  - Includes Subpart OOOOa requirements
- Well pad Permit G70-D – issued Sept 2016
  - G70-A, G70-B, G70-C continue but G70-D required, if modified
  - Incorporate Subpart OOOOa
- NG Compressor/Dehydration Permits G35-D - Issued January 27, 2017
  - G30-D, G35-A, G35-C continue but G-70D required, if modified



# AIR PERMITS



## Pennsylvania

- Well pad exempt if complies with Category #38. If exceed noted conditions permit required.
- Compressor station require permit typically permitted under GP-5

### Comments

Draft Compressor Station (GP-5) Permit and Category #38 Exemption revisions and proposed well pad permit (GP-5A) to incorporate:

- Gov. Wolf Methane Reduce Initiatives
- NSPS/NESHAP
- Increased recordkeeping and reporting
- Public comment ended June 5, 2017



# AIR PERMITS



## Pennsylvania – Proposed Well Pad Permitting (GP-5A)

- Divide Category #38 Exemption into two categories:
  - 38a - Conventional/unconventional NG well sites constructed/modified between Aug 10, 2013 and GP-5A effective date eligible
  - 38b - Conventional NG wells sites constructed after effective date of GP-5A eligible
- Draft GP-5A applicability:
  - Unconventional NG Wells
  - Remote Pigging Station – Not located at unconventional NG well site, compressor station, processing plant or transmission station whose emissions exceed 200 tpy - methane, 2.7 tpy - VOC, 0.5/1.0 tpy single/total HAPs.





# AIR PERMITS



## Pennsylvania – Proposed Well Pad Permitting (GP-5A)

- Draft GP-5A (well pads) Requirements
  - Obtain permit prior to earth disturbance
  - Includes well drilling and completion requirements
  - Municipal and PADEP Notifications
  - Glycol Dehydration Units, Pigging and Storage Tanks - 98% control if emissions > 200 tpy methane, 2.7 tpy VOC, 0.5/1.0 tpy single HAP/total HAP
  - Tanker Truck Load-Out Operations - ensure vapor recovery system and trucks are appropriately certified.
  - Fugitive Emissions Components - monthly AVO and quarterly LDAR via FLIR, Method 21 or other approved method. Reduce frequency if < 2% of components leaking in 2 consecutive inspections.
  - Controllers - install electric controllers if electricity is available.
  - Pigging Operations - install liquids drain in receiver chambers, to route emissions from high-pressure launcher/receiver to low-pressure vessel/line.
  - Record 12 month rolling emissions.
  - Annual Compliance report due March 1 each year.



# AIR PERMITS



## Pennsylvania – Proposed Well Pad Permits (GP-5A)

- GP-5A COMMENTS

- Over 10,000 comments received
- PADEP reviewing – expect additional stakeholder meetings
- Comments -generally supportive of GP-5A with tweaks
  - Eliminate off-ramp for LDAR
  - LDAR should be completed monthly
  - Temporary operations (Drilling, Completion) should not be included in permit
  - Federal requirement should not be included in permit



# AIR PERMITS



- **Pennsylvania** - Compressor Station Proposed Revisions
  - GP-5 issued in 2006 and revised in 2011, 2013 and 2015.
  - Most recent proposed revision include:
    - Same as well pad plus:
      - Stationary Natural Gas-Fired Combustion Turbines - BAT requirement for turbines > 1,000 hp to meet emission limits for NO<sub>x</sub>, CO, NMNEHC and PM.
      - Centrifugal Compressors-recordkeeping requirements for centrifugal compressors that are not subject to Subpart OOOOa.



# AIR PERMITS



## OHIO

- OEPA exempts drilling from permitting, however, permit required once equipment installed (GP-12)
- Compressor stations typically permitted under OEPA General Permit (GP-9, 14,15,16,17, 18 & 19).
- PM emissions associated with roads issued under separate permit (GP- 5) - revised 2016



# AIR PERMITS



## OHIO

### Compressor Station

- GP for Compressor Station revised March 2017, includes:
  - 22 General Permits
  - 120 Guidance Documents
- Permit Process
  - Complete relevant forms (GP-9, 14,15,16,17, 18 & 19)
  - Calculate total emission to demonstrate eligibility
  - Modeling required if:
    - Criteria Pollutant- emit > 40 TPY NO<sub>x</sub> etc.
    - Air Toxic- emit >1 TPY of listed Toxic Air Contaminant

### Well Pads

- Discussed revising 12.1/12.2 to incorporate Subpart OOOOa (align LDA with EPA) however stay has put revision on hold





# OPERATING REQUIREMENTS

- Engines – IIII/JJJJ/ZZZZ
  - Ensure all requirements addressed
  - Certified Engines < 100 HP vs large engine
- Dehydrators- HH
  - If gas composition or operating parameter (anything that affects emissions) changes, need to revisit emissions
- Tanks – OOOO/OOOOa
  - Ensure flash emissions included
  - Wet Gas vs. Dry Gas (Gas Liberation Analysis)
- Fugitive Emission
  - OOOOa/State Requirements
  - State buying cameras

# TANK EMISSIONS



## Emissions Calculations Requirements

- Subpart 0000/0000a requires emissions calculated within 30 days after liquid enter tank
- PA, OH, WV – Mirrors 0000/0000a (do not specify tank emission determination method). In addition, WV (G70-D and G35-D) requires pressurized liquid sample collection if control device not used
- Three emissions associated with tanks – Working, Breathing, and Flashing
- Commonly used models:
  - EPA TANKS – Only calculates working and breathing
  - E&P Tanks – Calculates working, breathing, and flashing. Requires a pressurized liquid sample analysis via GPA Method 2186
  - ProMax® – Full process simulator. Calculates working, breathing, and flashing. Can use gas or liquid analysis.

# TANK EMISSIONS CONT.

## Emission Calculation Comparison

- Wet Gas
  - Sample dictated by model used (i.e. EP Tanks condensate sample, Pro-Max- condensate or gas sample)
- Dry Gas
  - Issue, no condensate therefore:
    - Need to assume condensate % of brine (TX has documented 1% assumption)
    - WV – Requires a pressurized liquid sample be taken if a control device is not used
    - May 31, 2017 – CO issued Gas Liberation Analysis Calculating Memo to determine emissions from brine/produced liquid tanks

# COMMON VIOLATIONS



## **WV**

- Documentation of emissions
- VRUs and tank thief hatches not inspected/maintained (Not Operating Properly)

## **PA**

- Documented 28% have not submitted or incorrectly completed Category 38 Compliance Report

## **OH**

- VRUs and tank thief hatches not inspected/maintained (Not Operating Properly)

# ON THE HORIZON



- Electronic Reporting
- Pigging
- Permits





# ELECTRONIC REPORTING



## EPA

- Under Subpart OOOOa all required reports must be submitted to EPA via CDX including:
  - Annual certifications (online submission pending) no later than 90 days after the end of the initial compliance period for:
    - Well completions
    - Compressors
    - Pneumatic Controllers/Pumps
    - Storage Tanks
    - Fugitive Emission Monitoring
  - Performance tests
    - must be submitted within 60 days of the test (in effect)



# ELECTRONIC REPORTING



## States



- OH – submit via e-business center
  - Permit Applications
  - Permit Evaluations Report (PER)
  - Fee Emission Report



- PA – Greenport – Annual Emission Statement
  - Working on electronic permitting system to GP-5/5A



- WV – in process of developing

# PIGGING EMISSIONS



- Reporting and controls differ by state

- PADEP requires



- Reporting pigging emissions on Annual Emission Inventory
    - Proposed 98% control if emissions > 200 tpy methane, 2.7 tpy VOC, 0.5/1.0 tpy single HAP/total HAP pigging at well pad, compressor station and remote pigging station

- WVDEP requires



- Compressor Station (GP-35D)- include pigging emission estimates in application and tracking of # of events
    - Well pad (GP-70D) only request emission estimates in application

- OHEPA



- Compressor station (GP-21.1) -
    - VOC emissions shall not exceed 0.27 ton/ mo, averaged over a rolling 12-month period.
    - Document each event, record monthly emissions and report on annual Permit Evaluation Report (PER)

# TRUMP IMPACTS



- America First Energy Policy- “The Trump Administration will embrace the shale oil and gas revolution...”
- Environmental Actions
  - GHG Information Collection Request (ICR) withdrawn March 3, 2017
  - Subpart OOOOa
    - April 18, 2017 - Stayed Fugitive Emission until Sept. 1, 2017 (90 days after effective date)
    - June 5, 2017 - Added following to stay:
      - Fugitive Emission
      - PE Certification - closed vents
      - Pneumatic Pump - Technical certification for routing emissions
    - June 15, 2017 - Proposed 2 year stay to study 3 issues
    - July 2017 – Courts vacated EPA 90 day stay
    - August 2017 – Court stated EPA must enforce Subpart OOOOa but 2 year review proposal remains in place



# CLOSING THOUGHTS



- Air requirements are evolving
- States will likely continue to take lead in regulatory activity
- Seeing operators embracing LDAR
- Clarifying when permit required
- Increased recordkeeping (12 rolling month emissions) and reporting
- EPA and State staffs getting up to speed
- Information required for Pigging and Load-out emissions
- Modeling requirements will increase





# Publications



Access link below to obtain a copy of these publications:

## **Air Regulation Requirements in the Marcellus and Utica Shale Region: Management Approaches and Case Study**

*(Authored by Thomas Seguljic, PE and John P. Martin, PhD)*

*Published in Environmental Quality Management - Wiley online: Fall 2016*

**Environmental  
Quality Management**



## **Emissions Regulations: Subpart W Rules Present Challenges**

*(Authored by Thomas S. Seguljic, PE, John P. Martin, PhD, and Gary Stiegel Jr., PE)*

*Published in The American Oil and Gas Reporter: May 2016*



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**THANK YOU.**

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