Natural Gas Air Quality Regulation
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Topics

• Natural Gas Air Quality Regulation
• Air Quality Issues
• Other Issues
Natural Gas Processing
Natural Gas Well Sites

• ODNR covers drilling, fracturing, flow back, etc. Must get a drilling permit. Must report various activities. ODNR inspects facilities for compliance with ODNR rules.

• U.S. EPA has air rules for drilling and fracturing engines, permitting requirements

• U.S. EPA has air rule that covers flow back and other activities
Natural Gas Well Sites

• Ohio EPA requires permits for “production” activities
• U.S. EPA has air rules for well sites
• Ohio EPA has issued a “general permit” for the well sites that incorporate in Ohio EPA and US EPA standards
DRILLING/FRACTURING PHASE
Drilling Phase Equipment

• Portable drilling rigs w/ diesel engines (3-5,000 HP TTL)
• Diesel compressor engines (~3,000 HP)
• “Construction” roads
• Portable storage tanks
• Temporary flare to handle gas safely
• Mostly regulated by ODNR
• Engines regulated by U.S. EPA
Fracturing Process

- Pump out fluid
- Move to next part of well
- “Flow back” of fracturing fluids to storage tanks
- Regulated by ODNR and U.S. EPA
Fracturing Phase Equipment

- Large diesel engines for pumping fracturing fluids (15 engines at 1,125 HP each = 17,000 HP)
- Temporary storage tanks
- Much support equipment needed
- 2-3 days per well
- Engines regulated by U.S. EPA
Source: Chesapeake Energy Corporation, 2008

11 Hydraulic Fracturing of a Marcellus Shale Well, West Virginia
PRODUCTION PHASE
Production Phase

- Install gas conditioning equipment, liquid storage tanks, control equipment
- Designed to control pressure, flow; remove water, remove organic liquids
- Equipment generally stays static
- As gas flow changes with time, equipment may be swapped out
Production Phase
Equipment

• Dehydration/conditioning system
• Natural gas-fired engines for compressors (up to 1800 HP total in Ohio EPA’s General Permit - GP)
• Diesel-fired engines for power generation (up to 250 HP total in GP)
Production Phase Equipment

- Water and petroleum liquid storage tanks (up to fifteen 39,000 gallon tanks, 252,000 gallon site total)
- Combustor/Flare (no more than 10 mmBtu/hr normal, 250 mmBtu/hr emergency)
- Ancillary equipment (compressors, pumps, piping, etc.) (equipment leaks)
- Unpaved roadways
Pollutants Expected

- Criteria (NOx, PM, CO, VOC, SO2(little))
- Some HAPS (<10/25)
  - Acetaldehyde
  - Formaldehyde
  - Benzene
  - Ethyl benzene
  - N-Hexane
  - Naphthalene
  - Toluene
  - Xylene
  - H2S (not expected in Ohio)
General Permit Approach

- Drilling and fracturing phases are exempt
- Production phase is not
- GP designed to cover most, but not all, well sites
- Covers well site (six wells typical)
GP Unique Features

- Allows installation of various size engines if combined HP limit met
- Allows swapping of engines w/o new permit
- Allows installation of various size tanks
- Restricts total flow to tanks
- Requires very basic leak detection/repair program
What Major Air Rules Apply?

• MACT Subpart HH, Oil & Gas
• MACT Subpart ZZZZ (SI ICE)
• NSPS Subpart JJJJ, IIII (SI, CI ICE)
• NSPS Kb, tanks
• NSPS Subpart OOOO: Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution
• Ohio EPA’s Best Available Technology (BAT)
• Ohio EPA Particulate rules (OAC Chapter 3745-17)
COMPRESSOR STATIONS
Compressor Stations

- NG fired engines that drive compressors
- Used to boost pressure to cause NG to flow
- Produces combustion emissions
- Typically medium sized air pollution sources
- Dozens of these operations in Ohio
- Developed general permit to streamline processing and enforce uniform standards
Compressor Stations

- Can include additional sources of emissions
- Storage tanks for liquids
- Glycol dehydration units
- Flares
- Fugitive emissions (equipment leaks)
MIDSTREAM/FRACTIONATION FACILITIES
Midstream Processing Facilities

• Two general types
  – NG separation/processing facilities
  – Fractionation facilities

• Separation/Processing Facilities
  – Takes “wet” gas and removes water and natural gas liquids (ethane, propane, butane, etc. organic liquids)
  – Compressors, flares, tanks, fugitive (equipment leaks)
  – Prepares gas for pipeline
Fractionation Facilities

• Fractionation facilities
  – Takes natural gas liquids and splits up the components
  – Ethane; propane; butane; natural gas gasoline; etc.
  – Components are sold to other companies to make products, use as fuel.
  – Heaters, flares, fractionation towers, tanks, fugitive, etc.
Fractionation Facilities

• Largest facilities (only few in state)
• Typically includes compressors, fractionation towers, flares, tanks, roadways, rail loading, fugitive (equipment leaks)
• Requires a case-by-case air permit
• Contact Information

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