Understanding Natural Gas Pipeline Infrastructure and Impacts

DAVE MESSERSMITH
MARCELLUS EDUCATION TEAM

Penn State Extension
Pipeline Infrastructure & Impacts

• Pipeline Construction

• Pipeline-Related Infrastructure

• Impacts in the Landscape

• Pipeline Safety

• Landowner Role and Needs
Pipeline Infrastructure Background

- Traditionally PA has been a net consumer of natural gas with gas flowing into and through the state from Gulf and mid-continent.

- Very little pipeline infrastructure in Marcellus fairway, especially in central and NE PA.

- Marcellus shale will bring significant levels of new pipeline construction to the region.
Types of Natural Gas Pipelines

• Gathering System
  – PA DEP – E&S regulation

• Interstate Pipeline System
  – FERC – sighting and E&S
  – US DOT (PHMSA) – safety

• Distribution System
  – PA PUC - safety
Pipeline Construction Process

- Acquiring the right of way (ROW).
- Planning route, surveying.
- Permitting.
- ROW is cleared.
- Topsoil removed, trench dug.
- ‘Stringing Pipe’
- Pipe is welded and contoured.
- Pipe Lowered into trench.
- Pipe buried & site restored.
Pipeline Related Infrastructure

• Valves
• Pigging Launchers & Catchers
• Drying and Metering Facilities
• Compressor Stations
• Pipe Yards
• Temporary Water Lines
Pig Launcher

Valve

Source: Wikipedia.org
Disguised Compressor Site

Source: Patrick O’Dell, National Park Service
Painting to hide structures?

Source: Patrick O’Dell, National Park Service
Temporary Water Line in ROW
Pipeline Marker

- Lists contents of pipeline.
- Lists Operator.
- Emergency contact info.
- Indicate general location of line.
- PA One Call - 811
Pipeline Impacts

- Habitat Fragmentation.
- Invasive Weeds.
- Impact on View-Sheds.
- Affect on Property Values?
- Air Quality.
- Noise.
- Safety Concerns.
Reducing Pipeline Impacts

- Locate new pipelines in or along existing rights of way.
- Use existing boundary areas (roads, fence rows, property lines, forest edges).
- Consider ways to integrate above ground infrastructure into the landscape.
- Can communities and operators work together to better plan pipeline development?
Pipeline Safety Background

• Gas pipeline incidents in San Bruno, CA, Allentown and Philadelphia bringing attention to importance of pipeline safety.

• Aging infrastructure and increasing residential development nation wide.

• In PA, ‘line hits’ and old (cast iron and unprotected steel) pipe account for majority of incidents.
National, Gas Transmission, All Reported Incidents: Count 1991-2010

Source: PHMSA Significant Incidents Files March 1, 2011

National, Gas Transmission, All Reported Incidents: Injuries 1991-2010

Source: PHMSA Significant Incidents Files March 1, 2011
Development Near Existing Pipelines

Figure 1 - 1990
Washington State

Figure 2 - 2002
Potential Impact Radius

- Potential impact radius can be determined by knowing diameter and pressure of pipeline.
Class Locations

- Determined by number of buildings within 220 yards on each side of pipeline per sliding mile.
- **Class 1 location** - 10 or fewer buildings.
- **Class 2 location** - more than 10 less than 46.
- **Class 3 & 4 locations** – more than 46 buildings and buildings with high occupancy (churches, schools, etc).

- Class determines pipeline standards and frequency of inspections.
Landowner Role and Needs

• Right-of-way and surface use agreements are perhaps best place to protect the look, feel and safety of the community.
• Range of knowledge and negotiating skills.
• Host of pipeline easement considerations.
• Financial considerations.
• Landowners should always seek legal council.
• Right-of-way do’s and don’ts.
Example Easement Considerations

• Limit the easement to one pipeline of a stated diameter, no additional pipelines and no right to increase the diameter of the pipeline.

• Definition of substances that can be transported in the pipeline.

• How will disputes with the pipeline operator be resolved?

• What surface uses by the landowner will be prohibited in the easement?
Summary:

• Pipeline Construction
• Pipeline-Related Infrastructure
• Impacts in the Landscape
• Pipeline Safety
• Landowner Role and Needs
Dave Messersmith

Penn State Cooperative Extension
648 Park Street
Honesdale, PA 18431
570-253-5970 x 4110
dtm101@psu.edu

On Twitter: @PSUmarcellus

http://extension.psu.edu/naturalgas
Website & e-newsletter
www.extension.psu.edu/naturalgas

- Primers
  - Marcellus Shale: What Local Government Officials need to Know
  - Natural Gas Exploration: A Landowner’s Guide to Leasing Land in Pennsylvania
  - Natural Gas Exploration: A Landowners Guide to Financial Management
- Short Fact Sheets