



Questions Citizens and Local Leaders Should Be Asking

It is difficult to predict the specific long-term social, economic, environmental, and policy impacts of natural gas drilling and development associated with the Marcellus shale deposit. However, experience in other regions of the United States suggests the issues and impacts from such developments can be far reaching and profound for people and places. Because of these potentially broad and widespread impacts, it is essential for local leaders and citizens of affected communities to consider as many of these issues as possible—both negative and positive. While some impacts and consequences may be problematic, the Marcellus shale development also affords opportunities for communities to positively shape their long-term development, sustainability, and quality of life.

The following issues and questions highlight concerns local leaders and citizens should consider, based on the impacts experienced by communities across the United States with natural gas and other energy-related development, particularly in Texas, Wyoming, and Colorado. How communities within the Marcellus shale region will be affected is yet to be seen, but the lessons learned from other regions provide a valuable starting point for identifying areas in which local leaders and citizens can anticipate and begin planning for potential changes resulting from the develop-

ment and extraction of Marcellus shale gas.

Because this list seems daunting, the end of this publication provides ideas and steps to take that will help local leaders and citizens take action. These steps can provide a foundation for taking actions that will assist with assessing, monitoring, and planning for potentially positive and negative impacts of natural gas development.

Population Changes

Communities experiencing natural gas development and extraction are likely to experience population increases associated with both short- and long-term labor migration. Most labor increases occur in the early phases of development (the predrilling or exploration phase and in the drilling phase). The laborers associated with these initial phases are a combination of temporary and resident workers. The majority of workers will be transient crews skilled in specific stages of exploration or drilling (including drilling, hydraulic fracturing, and pipeline construction) and include engineers, landmen, and roughnecks on the drilling rigs. These crews travel around the country as assigned by the operator for whom they work and typically rotate on and off the jobsite weekly. These workers tend to be male, between the ages of twenty and forty, and represent a mix of ethnic backgrounds. The number of local work-

ers hired depends on the presence of the needed skills (such as mechanics, construction workers, heavy equipment operators, etc.) within the local labor force.

The population is likely to fluctuate; initially, there will be a large spike as transient, temporary, and permanent workers arrive to work in the industry. Over time, transient and temporary workers will leave, but an overall increase in population related to permanent settlement and economic growth stemming from the energy industry can be expected. The implications of these population changes can affect the provision of services, labor force availability and skills, and local infrastructure. Below are some questions local officials and citizens need to ask.

Housing Considerations

Will the increase in temporary and permanent population create a strain on the availability and affordability of housing? Are there sufficient temporary housing facilities, such as hotels/motels, trailer parks, campgrounds and RV parks, and rental units? Are there sufficient permanent housing options for workers who want to settle into the community? How can the community prepare to meet the needs of those families and individuals who will not be able to find or afford a home? If additional housing is needed, how will the community absorb unoccupied units when temporary workers leave? Are there effective land-use planning procedures in place to manage the potentially rapid addition of housing developments?

Physical Infrastructure Considerations

Will the increase in population and/or housing development increase demands on water, sewer, roads, telecommunication, and other physical infrastructure? What can be done to prepare for such increased demand? Are current facilities at a stage where such increases could push equipment and structures past their capacity, requiring investment in additional facilities? How can counties and townships prepare for

the increase in traffic associated with the drilling and extraction activities (particularly heavy truck traffic) and short- and long-term economic growth?

Emergency and Community Service Considerations

How will local municipalities handle increased demand for emergency services such as police, fire, medical, and hazardous materials teams? How can first responders prepare for a new set of potential injuries associated with drilling and pipeline construction? What additional training or information is needed by first responders to be prepared for the types of situations they might encounter related to natural gas drilling and extraction (including hazardous materials and injuries)? Do first responders have the communication operations necessary to find and get to well and pipeline sites in the event of an emergency? Do emergency services personnel have enough of the right equipment for gas-related situations? How can emergency-preparedness committees and organizations plan for the potential increase in service runs and equipment needs? How can police services and the judicial system prepare for a potential increase in criminal activity, particularly that related to substance abuse? How can medical providers prepare for increased demand for both emergent and preventative services? Could some of the costs associated with this increased demand for specialized emergency service be compensated with funding from the natural gas industry?

Considerations for Schools, Community Agencies, and Organizations

How will local schools respond to potential population and enrollment increases with regard to both personnel and infrastructure? Does the school system have the capacity to address new children's needs, especially the particular needs of children whose families are temporary residents? How can the school systems and other organizations prepare for the possibility of a more diverse ethnic and socioeconomic

community? How can local service agencies plan for increases in the number of preschool-aged children (such as day care, preschools, early intervention, and special needs)? How can community leaders take advantage of the growth in the energy industry to create economic and social opportunities for young adults that will keep them in the community?

Considerations about Community Dynamics and Relationships

How can local leaders and community residents prepare for the increase in number of people and the change in the composition of the local population? How can new residents be integrated effectively into the community? Can community organizations create opportunities for engaging new and long-term residents? How will community organizations and local governments assess and address the needs of both long-term and new residents (transient, temporary, and permanent)? What planning should be done to address needs of populations that may be particularly at risk in times of financial change and uncertainty, such as the elderly, poor, and youth?

Economic and Fiscal Changes

With an estimated \$500 billion in recoverable natural gas from the Marcellus shale, the economic impacts of its development are expected to be extensive. The influx of income is expected to generate thousands of new jobs, spur population growth, and boost gross state product and real disposable personal income, particularly for those working within the industry and those with leased land.

Because of current Pennsylvania tax law, however, any direct increases in tax revenue are unlikely to be realized by the local jurisdictions (municipalities, counties, and school districts) where the largest impact on local services are likely to be felt. In addition, local businesses whose employees have similar skills to those used in natural gas production and extraction (such as diesel repair and welding) are likely to face worker turnover,

difficulty finding employees, and increased payroll costs. Inflation, increased cost of living, and lack of services are problems confronting communities with natural gas development in other parts of the country.

Issues for Landowners

How can those who receive income from lease payments and royalties be prepared to manage this income? What systems can be put in place to encourage wealth management and succession planning? How will Pennsylvanians who receive lease payments and royalties be encouraged to spend and invest locally, capturing more of the income for local growth and development? How will those who own forested or agricultural land be able to incorporate the natural gas development into their long-term plans for the land? Can those benefiting from this newfound wealth be encouraged to be philanthropic within their communities?

Considerations for Existing and New Businesses

How can local businesses compete for the new business opportunities arising from natural gas? How will local entrepreneurs meet increased demand for goods and services? How will businesses in other economic sectors compete for key resources, such as land and skilled workers, that are in demand for natural gas development? How can these other businesses position themselves to be attractive for investment and growth stemming from new local wealth? How can the tourism industry—very important in some regions of the Marcellus shale—mitigate the impact of natural gas development on potential tourists' perception of the region as well as availability of key resources (such as hotel space and campgrounds)? How can economic development efforts both build on growth in the natural gas industry and foster other local businesses to create strong, diverse local economies that will be sustained after the drilling is completed?

Considerations for Workers and Workforce Development Programs

How can Pennsylvania's workforce position itself to be the first choice of employers to fill gas-related jobs? How can school districts, community colleges, technical schools, and workforce development corporations rapidly train the number of workers needed within the natural gas industry? How will workers in other industries—particularly in low-wage jobs in the retail and service sectors—adjust to potential increased inflation and cost of living caused by worker demand within the natural gas industry? Will the relatively high wages paid by the gas industry make competing for high-quality labor harder for local business?

Considerations for Local Government Officials

How can local governments (counties, townships, boroughs) plan for the potential increase in demand for local services, particularly with little or no additional revenue? How can local governments that own land maximize their return on the leasing of the gas rights? How can local governments manage the revenue in a way that will increase the fiscal health of township, borough, or county and protect the interests of its citizens, both now and in the future? Do local governments have the capacity and planning mechanisms in place to anticipate and respond to land use and subsequent municipal service costs?

The impacts of Marcellus shale development will most likely be felt longer than the term of a specific governmental official. How can a particular agency, organization, or officeholder be designated to assume responsibility for coordination of natural gas issues within the municipality or county?

Environmental Changes

The exploration, drilling, and extraction processes, as well as the infrastructure needed to transport the natural gas, all have potential impacts on the natural environment. Exploration and drilling require access roads—either existing or new—as well as clearing and preparation for well pad sites. The natural gas extraction process uses high-pressure injections of water, sand, and other liquids to fracture the shale. This process is referred to as hydrofracturing. Once the wells are drilled, the well pads are reclaimed, meaning they are returned to their predrilling use, with the exception of a smaller area required for well maintenance. The details of reclamation (such as vegetation type and amount) can be detailed in the leasing contract. When a well has ceased producing, it is generally the responsibility of the gas company to cap the well and fully restore the site. The wastewaters (brine) that are generated from the process require treatment before they can be discharged to the environment.

Much of the environmental aspects of these processes are regulated by the Susquehanna River Basin Commission, the Delaware River Basic Commission, and the Department of Environmental Protection. During the permitting process, gas companies have to account for any environmental impacts they have on Pennsylvania's forests, wildlife, surface and groundwater, air, and soils.

Water Quality and Quantity

How can communities plan for water withdrawals by gas companies? How can water providers sell water to gas companies and balance the needs of other residents and industrial users? How can landowners with private wells and/or septic systems be prepared for the potential impacts, rights, and responsibilities they have related to water quality and monitoring? How can communities encourage the development of local businesses that will offer environmental services, such as those related to safe brine disposal? How can environmental and other com-

munity organizations access and gather data related to the monitoring of water quality and quantity?

Noise and Air Pollution

How can communities influence the location and construction specifications of compressors and other facilities needed for natural gas extraction and transport to minimize noise? How can community leaders influence the location of roads to minimize noise and emissions from trucks and other vehicles? How can environmental and other community organizations access and gather data related to the monitoring of noise and air quality?

Forest and Wildlife Habitat

How can local leaders and citizens influence the natural gas development, extraction, and transportation structures and processes to minimize impact on wildlife habitat and forest fragmentation? Are there efforts to monitor the impact on forest and wildlife? If not, can one be created (potentially through volunteer groups, such as sportsmen's, conservation, or watershed organizations)?

Land Use

How will the development of access roads and well sites affect future land uses, including agriculture, forestry, residential, commercial, and recreation? How will the natural gas infrastructure particularly affect development of land previously thought not suitable for development, such as those with large slopes? Will new pipeline easements be aligned with current rights-of-way and not preclude the future development of the property? Does the municipality have adequate comprehensive plans and regulatory ordinances for such potential development?

Environmental Literacy

Can schools incorporate more targeted educational programs that will ensure that the school-aged population is receiving the training necessary to recognize environmental impacts and to improve management of natural resources as this

group evolves into the community's leaders and citizenry?

Policy

Legislative policy and regulations will be important in determining the actual effects of the drilling process and its influence on the distribution of benefits and costs from the Marcellus gas play. Important state policy decisions include the following.

Local Control over Drilling Activity

The amount of local control over drilling activity in Pennsylvania is somewhat unclear even with recent court litigation. Until early 2009, Pennsylvania courts had been interpreting Pennsylvania's Oil and Gas Act of 1984 as preventing municipalities from establishing local standards and controls for oil and gas drilling, such as where drilling may occur and whether and how locally identified important assets or resources could be protected. In February 2009, the state Supreme Court ruled on two cases that challenged this interpretation, and in one case (*Huntley v. Huntley v. Borough Council of the Borough of Oakmont*) upheld a zoning ordinance that regulated the location of oil and gas wells. But in the second case (*Frederick v. Range Resources—Appalachia, LLC*) they struck down a general ordinance that regulated several aspects of oil and gas well operations. At the time of this writing, solicitors were still trying to interpret which types of local control should be permissible and under what conditions.

The cost of local infrastructure

Few would argue that drilling and natural gas production could have significant impacts on the services that local governments and school districts provide. Experience in other states suggests that development of the Marcellus may affect the size of the population, housing, emergency services, roads and other physical infrastructure, and the local economy. Under Pennsylvania's current local tax structure, local governments and school districts will receive few new revenues to

pay for any such increases in local services. Should tax rates be increased for everyone rather than just those directly benefiting from the play? This is a result of natural gas being exempt from the local property tax (unlike coal, limestone, sand, and other natural resources extracted from beneath the surface), and that leasing and royalty income is exempt from the local earned income tax.

How can local government officials and citizens work together to influence state legislation and policies that affect the potential social, economic, and environmental impacts of natural gas production? How can local governments address the immediate need stemming from increased demand for local services with state policies that create long-term revenue-collection processes? How can local government officials access revenues collected at the state level for local needs?

Beginning to Answer Questions about the Impacts of Natural Gas Development

This list of questions and considerations is overwhelming, and the task of addressing them daunting. Because there are long-term consequences of natural gas development, however, it is crucial to begin the process of identifying issues of concern and exploring options to manage the positive and negative impacts.

Action Steps for Local Leaders and Officials

Become educated about:

- The natural gas development process and timeframes
 - Leasing: 4–6 months
 - Exploration/seismic testing: 4 months
 - Site preparation and drilling: 4–8 weeks
 - Site reclamation: 2 weeks
 - Extraction and transport: 5–40 years
 - Maintenance over the life of the well: 5–40 years
 - Closure
- Potential impacts (positive and negative)
 - Environmental
 - Economic
 - Cultural
 - Municipal services and infrastructure
 - Land use
 - Community
 - Educational services
- Regulatory agencies and their areas of authority
 - Pennsylvania Department of Environmental Protection
 - Pennsylvania Department of Transportation
 - County Conservation Districts
 - River Basin Commissions (Susquehanna, Delaware)
- Gas industry representatives/contacts

Look internally and assess ability to take action:

- Know regulatory authority under the Oil and Natural Gas Act (check with your solicitor before acting)
- Inventory existing plans and regulations; determine need to update or create new
 - Land use
 - Comprehensive plan and official maps
 - Zoning, subdivision, and land-development ordinances (especially roads and driveways)
 - Open space and recreation plan
 - Capital improvements plan
 - Road posting and bonding
 - Business and economic development plans
 - Workforce training, education forecasts
 - Long-range plans for school districts, human service agencies
 - Municipal and organizational financial planning
- Identify position or entity to monitor natural gas issues
 - Elected official (chair, vice chair, etc.)
 - Municipal planning commission
 - Environmental advisory committee
 - Task force
- Assess (and improve, as necessary) facilitation and communication skills of key personnel

Identify stakeholders:

- Landowners
- Local natural-gas-related businesses and subcontractors
- Educational institutions
- Chambers of commerce
- Governmental officials and agencies
- Conservancies and land trusts
- Environmental and sportsmen's groups
- Natural gas industry
- Regulatory agencies
- Emergency management agencies

Establish good communication and relationships relative to natural gas issues:

- Identify community issues with high priority
- Determine how priority issues might be affected
- Identify specific action steps to protect/enhance priority issues
- Develop monitoring systems to assess change in these priority issues
- Where needed, identify regulatory authority and actions available

One part of this process is to become informed about the natural gas industry and the drilling process. It is also important to seek information about the types of impacts the industry could have on your community. It will also be important to learn about the regulatory structure—who regulates what component of the process, how that regulation occurs, and how concerns and complaints can be handled.

A second part of this process is to look internally. Consider the role that municipal and county officials, community groups, and individuals can play in monitoring and shaping

community and environmental impacts. Municipal authority is limited in the types of direct control it can have over the location of drilling sites due to the Oil and Gas Act. However, municipal and county authorities do control related areas that may be affected, including planning for land use, municipal finances, capital improvement, open space and recreation, business development, education and workforce training, emergency management, and human services. All affected agencies should consider examining existing plans and regulatory tools to determine how they

will be affected by or affect natural gas development and to determine the need to update or create new plans and regulations.

Similarly, municipal officials should consider creating a way to monitor natural gas issues. The development of natural gas resources will likely surpass the terms of elected officials and the employment of agency personnel. Identifying a position or entity with this responsibility will provide a means to keep on top of the issue, follow up on issues that arise, and track priorities identified, plans developed, and decisions made over time.

If individuals or organizations are going to be tasked with this issue, do they have skills related to facilitation, conflict management, negotiation, and communication? If not, developing those skills can increase the ability of local officials and community leaders to act proactively as well as respond to new issues.

A third action would be to reach out to community members. Who are the stakeholders, those individuals and groups who are likely to be affected by natural gas development? These stakeholders may have different and competing interests, which will need to be managed. It will be important to establish effective means of communication among these stakeholders to encourage productive discussions and planning efforts.

It is also essential to create community dialogue about what is important in the community and how these high-priority issues can be protected and/or enhanced by natural gas development. Some counties are developing task forces to do just this. The members of these task forces include all key stakeholders, such as local elected officials, representatives of county and regional agencies, environmental and community organizations, and the natural gas industry locally. Each task force has goals specific to their own issues, but generally task forces develop and implement plans that will take advantage of opportunities presented by the natural gas industry, monitor change, and plan for potential negative impacts. For more information about developing a natural gas task force, see Penn State Cooperative Extension publication *Marcellus Education Fact Sheet: Marcellus Shale Exploration and Development—Organizing a Community Task Force*.

Concluding Comments

While the development of natural gas resources in the Marcellus shale presents significant opportunities for Pennsylvania communities and residents, there are a number of potential changes to the social, economic, and environmental conditions of these communities. Community leaders and elected officials need to take advantage of these opportunities to influence the future of their communities by raising these and other questions and pursuing local and statewide efforts to address their concerns. These questions and processes provide a starting point to addressing these issues. We suggest that community leaders and elected officials work with citizens to address these concerns and seek assistance from Penn State Extension and other resources in these efforts.

Prepared by Kathy Brasier, assistant professor of rural sociology; Neal Fogle, community and economic development extension educator, Lycoming County; Barb Schramm, senior research technologist, agricultural economics and rural sociology; and Tim Kelsey, professor of agricultural economics.

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The Penn State Extension Marcellus Education Team strives to bring you accurate, up-to-date information on natural gas exploration and drilling in Pennsylvania. Learn about your rights and choices as a landowner, a businessperson, a local official, or a concerned citizen. Discover the resources available to you.

Visit naturalgas.psu.edu.

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