Frequently asked Questions (FAQ)
About Natural Gas Shale Development
TGCC Marcellus Work Group

If you are seeking information about the benefits and potential risks of developing the natural gas reserves found in Marcellus/Utica shale within Western Maryland, you have come to the right place. The Greater Cumberland Committee (TGCC) Marcellus Work Group is presenting these FAQs as our best effort to answer the many questions heard in the community. We certainly understand that there are real risks to consider when withdrawing any resource from the subsurface shale found in our Appalachian region. Please feel free to submit questions to cdeberry@garrettcounty.org if you do not see a topic covered.

We recommend the web site http://marcellusshale.garrettcounty.org/ as an excellent local source of information.

Natural Gas Extraction

What is the history of the oil and gas industry in Maryland?
Natural gas is difficult to extract from shale because the gas is trapped in tiny pores within the shale rock formations. The combination of two long-used technological innovations has made extraction commercially viable in recent years: hydraulic fracturing (fracking) and horizontal drilling. The first horizontal well was drilled in 1929 and hydraulic fracturing was first completed in 1949. These techniques have been used in the Marcellus in Pennsylvania, West Virginia, Ohio, and New York. Activity specifically in the Marcellus Shale in Maryland has not yet occurred, pending development of regulations, although Garrett and Allegany Counties have experienced varying forms of natural gas activity for over five decades. These counties have also been receiving considerable interest by energy companies as a possible source of natural gas from the Marcellus Shale. The Utica Shale is another natural gas-filled formation below the Marcellus and is believed to extend beyond the two western most counties into Washington County, however, profitability of production in these areas has yet to be determined.

Is there a federal oversight group that can assist with the evaluation of current regulations?
STRONGER, is an acronym for State Review of Oil and Natural Gas Environmental Regulations. While not a federal agency, STRONGER was formed in 1999 to reinvigorate and carry forward the state review process begun cooperatively in 1988 by the U.S. Environmental Protection Agency (EPA) and the Interstate Oil and Gas Compact Commission (IOGCC). (http://www.strongerinc.org/). STRONGER offers a collaborative state review process whereby review teams composed of stakeholders from the oil and gas industry, state environmental regulatory programs, and members of the environmental/public interest communities, review state oil and gas waste management regulations against a set of guidelines developed and agreed to by all the participating parties.

Since its initiation, this state review process has completed the reviews of twenty-one state programs including Pennsylvania recently, responsible for the regulation of over 90% of the domestic onshore production of oil and natural gas. The TGCC Marcellus Work Group has met with STRONGER representatives and believes that it would be very beneficial if the Governor would agree to invite the group to perform a review for Maryland.

I have heard the fracking fluid contains chemicals that contaminate water wells. Is this true?
Fracking fluids are comprised of water along with one to two percent chemicals and sand that help facilitate the gas escaping from the shale. There are no verifiable cases or evidence that indicates that the fracking process has contaminated any potable well water supply with any fracking fluids or chemicals in the Marcellus formation. Proper use of multiple casings when preparing a well is seen as an important part of properly managing any risk of fracking fluid release. Flow-back fluids are stored in sealed tanks on the surface until, reused, treated or removed.

I have heard that fracking causes methane gas to appear in surrounding water wells. Is this true?
In a word, no. There have been isolated cases of increased methane levels in wells surrounding natural gas production. In these cases, it was an improperly cased well or a failure of the well casing, not the fracking process, which caused a problem. Although very rare, these cases do show that it is imperative for the well casing to be properly designed and that the proper testing be completed. It is important to understand that methane can already be found <u>naturally</u> in many wells, including some in Garrett County.

Where does the water come from that is used to hydraulically fracture a well?
The water comes from various sources. Many municipalities in other states sell water to the gas drilling companies as an additional source of income. Other potential sources are surface water impoundments, rivers and streams or ground water wells. In Maryland all water sources will need to be disclosed and if water from within the State is to be used, a Water Appropriation permit from Maryland Department of the Environment (MDE) must be issued.

How much water is required to hydraulically fracture a well?
Several million gallons of water is required for hydraulic fracturing; possibly as much as five million in some cases. As a comparison, current water appropriation permits allow over nine million gallons <u>per day</u> to be withdrawn in Garrett County (surface and groundwater), not including hydroelectric.

If we outlaw drilling for gas in Garrett County, will we <u>not</u> be subject to any of the risks associated with development of natural gas?
The development of natural gas in our neighboring states already subjects Garrett County to many of the risks associated with drilling. We have trucks hauling to and from well pad sites in adjoining states. There are drilling sites in upstream locations to Garrett County waters. If we address the risk and encourage the proper and safe development of the resource Garrett County can enjoy the positive impacts along with the existing activity in Pennsylvania and West Virginia.

How much fracking water is typically recycled?
The amount of immediate flow-back varies (10% to 25%), but most companies are performing preliminary treatments on all of this water to allow it to be re-used in subsequent projects. The amount of water being <u>reused</u> in the hydraulic fracturing process is significantly increasing. Water that is not recycled can be treated to drinking water standards and properly disposed of or placed in deep injection wells (however, this method is strongly discouraged and is becoming more expensive).

Will drilling be allowed in the Deep Creek Lake watershed or towns in the County? *The Deep Creek Watershed Zoning Ordinance currently allows drilling for, or underground storage of, natural gas. The wellhead and all areas used for storage or operation of equipment must be at least 2,000 feet from the high water elevation of Deep Creek Lake (2,462 feet above sea level) and 1,000 feet from the property line of any lot not owned or leased by the drilling entity.*

Has drilling and fracking been done in and around a lake or stream?
Gas wells have been successfully drilled and hydraulically fractured with the surface location of the well being near streams and lakes. In most horizontal wells, the lateral run crosses under streams and even under large bodies of water, however, because of the depth of the lateral (at least 7,000 feet in Garrett County) there is no impact to the surface waters. The main area of exposure to water sources is in the zone which the vertical portion of the well penetrates. This again highlights the importance of casing engineering and inspection. Horizontal drilling and hydraulic fracturing have been occurring nearby along Beaver Run Reservoir in Westmoreland County Pennsylvania, a drinking water supply reservoir (for over 80,000 people) since 2008 with no ill-effects. Visit www.fracfocus.org click the map and choose Pennsylvania, Westmoreland County and then click the "13" icon to see the site.

How will a gas lease affect the value of my property?
The potential impact of natural gas development is likely to be positive and negative. When wells are drilled the royalty payments to mineral rights owners can be huge. Some mineral rights owners have been paid six figure royalties each month. Just as timber and coal resources impact land value so too would the potential value of natural gas reserves. Wells have a 30 to 50 year productive lifetime. The first 10 years are generally the most productive. If millions of dollars in revenue are produced for a property owner certainly it would have considerable upward impact to the land value. The location of well heads and road traffic may be a somewhat negative, though likely temporary, influence on the land value. The potential impact on the value of your property should be determined by a local licensed real estate appraiser in conjunction with an engineer experienced in making valuations that include calculating resource reserves.

How will natural gas development impact Garrett County's economy?
The impact of a developed gas resource in the county will undoubtedly be a catalyst for growth in the area. Mineral rights owners could see significant payouts in royalty payments. When an economy is provided an opportunity to transform by vast wealth the impact cannot be denied. Many local business owners and residents believe that these riches will lead to necessary and desirable increased population. In turn, schools and businesses that are moderately performing will have the opportunity to meet their potential and the "brain drain" that has been occurring under our low to no growth situation in the past could be reversed to once again allow local youth to find jobs and opportunities in Garrett County. There will very likely be an initial wave of economic and employment impact during the years of the drilling phase. That phase of the extraction process is likely to exhibit the boom cycle (see CaRDI Report: http://marcellusshale.garrettcounty.org/images/documents/cardi%20report2.pdf) requiring careful planning to control the potential "bust" phase when the drilling and construction phases are concluded. The case can be made to compare the seasonal tourism sector 'gear up' and 'gear down' with a need to moderate those increases and decreases within the gas play by regulating the number of permits and time of year permits are issued. MDE has the authority to properly manage development of the Marcellus shale in Maryland.

On-Site Issues

The next six FAQs focus on the on-site issues of drilling pads and restoration. Look for future issues that discuss additional topics, such as pipelines, water, regulatory changes, and other issues associated with drilling for natural gas.

What is the size of the drill pad?

The drill pads will likely range from about three to five acres, depending on the company and what they plan on doing on the pad. Some companies will also include fresh water reservoirs on the pad while others will not. Crushed rock will be applied to the pad surface to help control mud and dust during the drilling and fracking processes.

What happens to trees that are on the drill pad when it is cleared?

The best place to deal with pad timber is in the lease agreement. There are many options, but your set of options will be affected by the gas company's policy.

One option for the landowner is to deal with merchantable timber himself/herself before drilling by working directly with a licensed forester (a list is available at www.dnr.state.md.us/forests/forester.asp). The forester can determine the timber value and then the landowner would sell the timber either by bid or negotiation. Non-merchantable timber would need to be felled and removed from the site.

Another option is the gas company can purchase the timber. Some companies will have the timber appraised by a forester, pay the landowner and then they will sell the timber to recover their costs. Some companies will cut the non-merchantable timber and then have it chipped. Other companies will offer the landowner a flat rate for the timber without an appraisal.

It may benefit the landowner to have the timber appraised by a forester independently. Having the help of a forester will be of benefit to the landowner in negotiations with the gas company.

Must the gas company restore the drill pad after drilling and fracking?

This issue is addressed in the Sediment and Erosion Permit required of gas companies. During the pad construction process the topsoil will likely be pushed to one side for use after the drilling and production activity. When the drilling activities are completed a majority of the pad will be restored to approximately the same contours as before drilling. Some companies routinely remove the rock to reuse elsewhere, others do not. The top soil will be placed back on the pad and the area reseeded.

What will the size of the pad area be for a producing well (after drilling and fracking are complete)?

This will vary by company. It will eventually and generally be about 1½ acres. Remember that the pad will not be completely reclaimed until the wells are no longer producing. The companies need access to the wells for regular observation and maintenance, to haul off production fluids that come to the surface (this flow-back is stored in tanks on the site), to re-frack at a later time, and other activities related to gas production.

What will be planted/seeded on the reclaimed well pad?

The pads are reseeded using MDE approved native plants. Trees are not typically replanted on the 1 ½ acre site until the wells cease production and are completely reclaimed.

Can the landowner request different plants to be used instead of the "normal" plants?
The landowner can request other plants. For example, the pad can serve as a wildlife food plot. In fact, some companies are encouraging landowners to consider this option. The seed mix needs to consist of MDE-approved species and should not include exotic invasive species. The best place to put this requirement is in the actual lease agreement. If the landowner is already leased, the landowner can negotiate with the gas company. The companies are generally willing to entertain reasonable requests.

How far must a gas well be located from a residence or public structure?
Within Maryland, MDE current standards require a gas well to be at least 1,000 feet from any residence, church or public building or from the property line of any lot not owned or leased by the drilling entity. Garrett County is considering additional standards that may apply to gas well set-back requirements.

How will a gas lease on my neighbor's property affect the value of my property?
The potential impact to a property resulting from uses on a neighboring property within the gas rights discussion is very similar to most other aspects of personal property rights. In the same manner that farming, developing, timbering, recreating, mining or just about any activity has some impact on adjoining properties, so too does natural gas development. The Garrett County Commissioners are considering certain additional standards that may mitigate the potential adverse affects drilling may have on an adjoining property.

What will be the most visible impact of the gas well drilling?
The impact on roads and highways will be significant. There will be a temporary increase in heavy equipment and truck traffic during the well pad construction, drilling, and fracking of each well. Garrett County asserts that it has authority to require bonding of roads when the frequency and/or size of trucks/loads are likely to cause negative impacts to roads. As part of the bonding process, companies must restore roads to at or better pre-activity conditions.

Is the wellhead the only thing that remains after the drilling process is concluded?
No, part of the process of extracting the natural gas involves separating water from the gas. This water is then stored in separation tanks that are placed on the pad next to the well. Subsurface or surface gathering lines will be added to move the gas to larger transmission pipelines. There also may be a need for a compressor station on or near the pad, though not every pad has a compressor station. The number of storage tanks and the size of the compressor will depend on the amount of gas being extracted and the number of wells that are drilled on the site.

I've decided to lease my property after being approached by several different companies. With whom should I sign?
Do your homework. Check with your neighbors to see if they have signed and with whom. Do not give in to high pressure sales tactics. Your gas rights have value, and you can negotiate favorable terms and conditions in your lease. Consider hiring an attorney or other professional to assist you.

What is being done to ensure public safety with respect to development of the natural gas from shale in Maryland?
Governor O 'Malley issued Executive Order 01.01.2011.11 in June 2011 (http://www.governor.maryland.gov/executiveorders/01.01.2011.11.pdf), establishing the Marcellus Shale Safe Drilling Initiative to "assist State policymakers and regulators in

determining whether and how gas production from the Marcellus shale in Maryland can be accomplished without unacceptable risks of adverse impacts to public health, safety, the environment and natural resources." A major part of the Initiative is the study being undertaken by MDE and the Department of Natural Resources in consultation with an Advisory Commission. This Advisory Commission includes representatives from Garrett and Allegany Counties, including a local mayor, commissioner, business owner, Senator, Delegate, and Farm Bureau president.

What response plans are in place in the event of an emergency?
Current MDE regulations on oil and gas exploration and production are directed more toward preventing emergencies than responding to emergencies. Questions about emergency response plans would be better directed to the Allegany County Department of Emergency Services and the Garrett County Department of Public Safety and Emergency Management. The Executive Order specifically directs the MDE and the Department of Natural Resources (DNR) along with the Advisory Commission to look at the capabilities of local emergency response agencies and the need for additional training.

The Garrett County Department of Emergency Services actively involved with the Garrett County Commissioners' Advisory Committee for Marcellus shale and is looking closely at what additional training and/or equipment may be needed.

What is MDE's role in water supply protection?
MDE's Water Supply Program implements various methods to ensure that public drinking water systems provide safe and adequate water to all present and future users in Maryland. It also assures that appropriate usage, planning and conservation policies are implemented for Maryland's water resources. This mission is accomplished through proper planning for water withdrawal, protection of water sources that are used for public water supplies, oversight and enforcement of water quality monitoring at public water systems, regular onsite inspections of water systems and prompt response to water supply emergencies. Perhaps this question relates specifically to water appropriation permits. The laws and regulations relating specifically to water appropriation permits can be reviewed in the Maryland Code, Environment Article, Title 5, Subtitle 5, and Title 26, Subtitle 17, Chapter 06 of the Code of Maryland Regulations.

Who regulates the oil and gas industry?
The oil and gas industry is regulated in various ways, by federal and state agencies. All aspects of their operations are regulated, either by the state, by federal or both. In Maryland, MDE is the primary state agency that regulates the oil and gas exploration and production industry sector. MDE has been given all the authority it needs to ensure that drilling is done safely and protects the environment. There is a helpful section on the regulatory framework in Modern Shale Gas Development in the United States: A Primer, available on MDE's web page at: www.mde.state.md.us/programs/Land/mining/marcellus/Documents/Shale_Gas_Primer_2009.pdf Additional information on laws and regulations administered by the federal Environmental Protection Agency can be found at www.epa.gov/lawsregs/sectors/oilandgas.html. Some aspects of gas transmission are regulated by the federal Department of Transportation Pipeline and Hazardous Materials Safety Administration, whose website is www.phmsa.dot.gov/portal/site/PHMSA. The Department of Labor, Occupational Safety and Health Administration regulates worker safety.