



**Department of the Environment**

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# Marcellus Shale Safe Drilling Initiative Study

**Part III  
Draft Final Report  
Findings and Recommendations**

**November 25, 2014**





# A Draft Report

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- Still considering comments on risk assessment
- Will consider opinions of Advisory Commission
- Will consider any additional comments from the public



# Introductory Material

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- Section I: The Initiative
  - Executive Order, Commission, Purpose and Charge
- Section II: Marcellus Shale Gas Development
  - Shale gas play, extraction and production process, existing laws and regulations
- Section III: Work under the Initiative
  - Presentations, briefing, contractor studies, MDE/DNR studies, first two reports



# First Report: Revenue and Liability

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- December 2011
- Two laws enacted based on recommendations
  - Financial Assurances
  - Presumption of Liability
- Future legislative action
  - State level severance tax
  - Surface owners protection act



# 2<sup>nd</sup> Report: Interim Final Best Practices

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- July 2014
- Comprehensive Gas Development Plan (CGDP)
- Location Restrictions and Setbacks
- Engineering, Design and Environmental Controls and Standards
- Application for a Permit to Drill



# New / Strengthened Best Practices

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- Based on the Public Health study, the Risk Assessment, and additional reflection, some practices have been added or strengthened
- These are referenced as **“New BPs”** in the following discussion of Principal Issues



## Section IV: Principal Issues

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- Citizens of Western Maryland have raised legitimate questions about the likely impact of Marcellus Shale gas development on public health, the environment and quality of life
- This report evaluates the key issues by explaining their significance, discussing the available information, and drawing a conclusion about Maryland's ability to manage the process



# Air Pollution

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- Short duration spikes in air pollution need more investigation
- Air pollution from operations at the pad and from traffic are a concern
- Air pollution from traffic can only be reduced by fewer truck trips
- Best practices should significantly reduce emissions at the pad
- Monitoring needed to confirm effectiveness of controls; if not effective, additional controls will be required



# Air Pollution

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- **New BPs:**
- Reduce the number of truck trips to deliver water to the well pad, if practicable for a specific site, by using a
  - Centralized water storage facility and transferring water to well pads using gravity and above-ground hoses or pipes
  - Centralized facility for preparing and pressurizing the fracturing fluid, in a location that minimize impacts to people and uses noise and air pollution controls, and deliver the fracturing fluid to the pad using above-ground pipes.
- Perform fracturing using alternatives to high volume water-based fracturing fluid, if feasible.



# Methane Migration

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- Contamination of drinking water is a concern
- No single practice exists that will eliminate the risk of methane migration
- The risk can be managed by a combination of setbacks, best practices, integrity testing, rigorous monitoring/inspections/enforcement, timely identification and correction of problems and mitigation if methane contamination should occur
- **New BP:** Establish a 2,000 foot setback from private drinking water wells that cannot be shortened by a variance



# Noise

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- A person's well-being can be affected by noise through loss of sleep, speech interference, hearing impairment, and a variety of other psychological and physiological factors.
- The best practices will ensure that noise levels will not exceed standards that are designed to prevent the disruption of human activities or cause annoyance to the average person
- **New BPs:**
- Noise modeling must be included as part of the plan to comply with noise standards.
- Noise reduction devices must be installed on all equipment at the drill site.



# Soil, Groundwater and Surface Water Contamination

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- Could occur through 1) surface spills during truck transport or releases from the pad, 2) drilling through drinking water aquifers or 3) casing and cementing leaks
- Likelihood of pad, well and drilling contamination is significantly reduced by best practices
- Trucking accidents are uncommon and rapid clean up is important
- **New BPs:**
- Expand the capacity of the zero-discharge drill pad to contain at least the volume of a 25 year, 24 hour storm event.
- Require at least two vacuum trucks be on standby at the site during drilling, fracturing, and flowback so that any spills occurring during those stages, which could be of significant volume, could be promptly removed from the pad.



# Casing and Cement Standards

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- Performance standards and minimum requirements
- Cement must separate casing from formation for the entire length of the borehole
- Integrity testing required
- **New BP:** Cement must be tested before use under conditions similar to those to be encountered downhole



# NORM and TENORM

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- Risks occur from improper handling of drill cuttings, flowback and produced waters
- On-site testing and proper disposal will be required to safely manage radioactive material.
- Specific testing methods and threshold levels will need to be developed
- **New BP:** Applicants for well permits will be required to disclose if they intend to use shaped charges containing radioactive material such as depleted uranium



# Use and Disclosure of Chemicals

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- Consideration is given to competing interests of the
  - public's right to know what chemicals are used
  - medical health community's ability to effectively treat patients and conduct research
  - industry's protection of confidential information
- Appropriate balance is achieved by requiring disclosure of chemicals while protecting legitimate trade secrets



# Use of Fresh Water

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- Maryland's water appropriation program is stringent enough to protect all users of fresh water resources
- **New BPs to decrease risks to sensitive headwater streams and Use III and Tier II waters:**
  - If feasible, one or more semi-permanent water withdrawal points from sources with large capacity and storage should be established
  - Require applicants to perform additional modeling for water withdrawal impact assessment in sensitive locations, such as Use III and Tier II waters.
  - Direct MDE and DNR to develop additional scientific guidance for monitoring and assessing potential ecological impacts to sensitive streams as a result of water withdrawals.



# Greenhouse Gas (GHG) Emissions

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- Estimates of GHG emissions have been made using emission factors, on site measurements, and atmospheric measurements.
- The range of estimates has been large, and the issue cannot be considered settled.
- Minimizing fugitive emissions of methane is necessary to realize any significant radiative forcing advantage over coal



# Controlling GHG Emissions

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- Green completion
- Top-down BAT
- **New BPs:**
  - Estimate remaining methane emissions and report to MDE
  - MDE will require offsets, if feasible



# Impacts on Habitat and Natural Resources

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- Setbacks establish protective buffer
- Concerns regarding the impacts of gathering lines will need to be addressed through the
  - CGDP and
  - development of siting and stream crossing guidelines designed to minimize impacts



# Impacts of Traffic

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- The use of transportation planning and road use and maintenance agreements can reduce but not eliminate traffic congestion and the impact of increased truck traffic on the condition of roads
- An outreach program to drivers of passenger vehicles and commercial vehicles should be undertaken to educate the drivers of the challenges of sharing the roads.
- **New BPs**
  - Reduce truck trips, if feasible, by using centralized facilities for water storage and mixing and pressurizing fracking chemicals
  - Upgrade the roads to be used so that damage to the roadways is minimized



# Potential Community Impacts

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- Agriculture: More income to farmers, but fewer farm laborers and loss of farmland
- Education/Schools: overcrowding from influx of workers and their families
- Housing: supply could be exhausted and prices could rise



# Industrialization of Landscape

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- Localized industrial activity will occur at the site of well pads
- Traffic and viewshed impacts are also a concern
- Conversion of land to industrial use could be as much as 1,125 acres or about 0.22 % of total land area within the shale play.
- MDP developing recommendations for local governments



# Influx of Workers

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- The influx of workers to Garrett and Allegany Counties will be highest during the active development phase but will be manageable



# Availability of Housing

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- Housing will be available in Allegany County
- Garrett County should plan for housing a temporary workforce to preserve housing stock for residents



# Economic Impact: Gas Production

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- More jobs, increased tax revenues, more income to owners and lessors of mineral rights
- Jobs are likely to last only a few years
- It is not clear how much of the royalty payments would go to Marylanders
- Jurisdictions that depend heavily on such industries operating under a “boom and bust” cycle often fail to diversify their economies, making them especially vulnerable when that industry leaves



# Economic Impact: Property Values

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- Property values in the vicinity of shale gas development could fall as much as 27%
- Devaluation can persist decades after drilling is complete
- Decrease in property tax receipts in Garrett County could occur if Deep Creek Lake property values drop
- Could be addressed through zoning; not a State environmental or natural resource issue



# Economic Impact: Tourism

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- Recognized as an important factor to consider, but one that is difficult to quantify
- If there are real or perceived adverse impacts, tourism and the outdoor recreation economy will suffer



# Emergency Response and Health Care Capacity

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- The burden on emergency, urgent care and trauma care will likely increase
- Emergency response is largely volunteer based and will need support and training from State/local agencies and industry
- The health care system is resilient enough to meet the increased demand without jeopardizing public health



# Waste and Wastewater Disposal

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- Wastes produced at well sites can contain contaminants and require proper management and disposal
- Testing methods exist
- Waste disposal will be tracked
- Management and disposal standards for NORM and TENORM will be developed



# Gaps

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- Lack of site specific geological and hydrogeological data
- Location of historic gas wells
- Wet vs. dry gas
- Technical data gaps
- Data on health and community impacts
- Seismic information



# Conclusions and Recommendations

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It is the judgment of the Department of the Environment and the Department of Natural Resources that provided

- all the recommended best practices are followed and
- the State is able to rigorously monitor and enforce compliance,

the risks of Marcellus Shale development can be managed to an acceptable level



# Conclusions and Recommendations

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- The following steps should be taken if Marcellus Shale gas development is permitted
  - Confirm effectiveness of best practices
  - Monitor air, groundwater and surface water
  - Use the CGDP to protect the environment and public health
  - Reduce the amount of truck traffic
  - Adopt new regulations and revise fees
  - Enact legislation
  - Manage adaptively



# Drafting Regulations

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- Revised regulations are currently being drafted
- Anticipate submission of regulatory proposal to Joint Committee on Administrative, Executive and Legislative Review (AELR) in December



# Going from Draft to Final

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- The draft Final Report
  - Builds on past reports; not very much new information; few new proposals
  - Changes could be made as a result of comments on the risk assessment
- Comments from the Commissioners and the public will be solicited
  - Today
  - At a December 8 meeting that will begin in the afternoon and extend into the early evening hours