



TOPICS FOR CONSIDERATION: "POTENTIAL PUBLIC HEALTH IMPACTS OF NATURAL GAS DEVELOPMENT AND PRODUCTION IN THE MARCELLUS SHALE IN WESTERN MARYLAND"

Offered by: Maryland Environmental Health Network

- The final study and public comment form can be found at: <http://www.marcellushealth.org/final-report.html>
- Public comments will be accepted through **October 3, 2014**

Maryland is the first state to complete a health study to be used in guiding state policy decisions about whether and how unconventional natural gas development (UNGD) should take place. This is a landmark accomplishment; the report is substantive. The report covers eight categories of hazards and presents 52 specific recommendations.

Maryland state agencies are accepting public comments through October 3, 2014. Comments can be submitted on-line through a form available at <http://www.marcellushealth.org/final-report.html>.

Public comments are an important means of showing state agencies that the general public cares about the policies they are developing. In this case, state agencies are deciding a critical question: Do we have enough information to determine whether and how UNGD can be done safely?

Health advocates can ask the State to continue studying how health would be affected by potential future drilling activity in Western Maryland. They can also ask state agencies to look at the health impacts across the state of Maryland of the gas industry including existing and proposed pipelines and compressor stations. These are two reasonable and health-protective next steps that Maryland can take.

The Maryland Environmental Health Network has prepared the following list of topics on which health advocates may wish to comment. We are offering a range of questions and issues which we believe are raised by the public health study and which merit further attention.

PUBLIC POLICY GUIDED BY SCIENCE

The overall message of this report is that UNGD carries high human health risks. This report provides two deliverables based on scientific evidence – an assessment of specific hazards and threats and a set of recommendations. A key question for readers is whether the extent and severity of the hazards described by the report can be fully mitigated by the recommendations offered by the study authors from the Maryland Institute for Applied Environmental Health (MIAEH). Many of MIAEH’s recommendations call for further research, new community engagement methods, special monitoring and specialized studies; this suggests that the recommendations cannot guarantee adequate health protections.

- Readers may wish to highlight the overall message of the MIAEH report, which is the documentation of significant and potentially serious health hazards.
- Readers may wish to question whether the recommendations adequately address the hazards identified.

MIAEH’s study confirms that UNGD in western Maryland is very likely to be harmful to the health of residents. In 7 out of 8 areas, the research team found a high or moderately high likelihood of negative public health impacts: local air quality, the healthcare infrastructure, worker health, community cohesion (due to increases in crime, traffic, substance abuse, STDs), water quality, excessive noise, and cumulative effects from all of the above. (Table 6-1, p.xx)

Recommendations for protective measures are premature, because additional research is needed. Government, industry, and academic groups have called for more data collection, peer-reviewed research, and long-term studies on health effects of “fracking.” An NIEHS working group, the Inter-Environmental Health Sciences Core Center Working Group on Unconventional Natural Gas Drilling Operations, published their Environmental Health Research Recommendations in July of this year, stating that health outcomes research is “urgently needed.”

- Public comment can call for Maryland to benefit from this future research before establishing policy that is intended to be based on science.
- Commenters may wish to point out Maryland has time to wait for the results of studies that are underway in other states or that are being called for by industry, government, and academic groups.

Maryland’s current draft of proposed Best Practices for shale gas drilling do not address health hazards. Before this health study was completed, Maryland developed a set of draft Best Management Practices (BPs) designed to mitigate harms from drilling.¹ The first version of this document came out in August of 2013 and it was subsequently revised and published again in the summer of 2014 before the health study was released. Although titled “Best Practices,” the Commissioners of the Maryland Marcellus Shale Advisory Commission could not come to consensus on supporting most of these proposed practices because of doubts about their proven value.

- Commentators may wish to call attention to the fact that the current Best Practices draft by the Maryland Department of the Environment does not address all hazards identified by the MIAEH report.

¹ http://www.mde.state.md.us/programs/Land/mining/marcellus/Documents/7.10_Version_Final_BP_Report.pdf

- There is a need for additional analysis and work on the proposed Best Practices now that the Public Health study has identified 7 areas where there is a “high or moderately high likelihood of negative health impacts.”

More peer review is needed. The Maryland Department of Health & Mental Hygiene solicited external peer reviews of this study. Three letters from subject matter experts can be found on the Marcellus Shale Advisory Commission’s web page:

http://www.mde.state.md.us/programs/Land/mining/marcellus/Pages/Health_Study.aspx. They offer a range of views on the MIAEH study and suggest next steps and corrections.

- Comments from the public can draw from these peer reviews to cite issues of concern and call for additional input from experts.
- Public comments can reference selected recommendations of these reviewers, including their comments on what is missing from the MIAEH study.

HEALTH OUTCOMES

Many of the health outcomes discussed in the report may be severe and/or irreversible. The following discussion highlights several examples:

Health Care Capacity

We can expect that hydraulic fracturing may introduce new adverse health outcomes and stress on already overburdened healthcare system. MIAEH recommendations focus on monitoring and reviewing in order to identify necessary changes to insurance and revenue that might be needed.

- Commentators may wish to address whether this is a sufficient response.
- Monitoring for health problems is not the same as preventing them from occurring.

The recommendations do not identify ways to increase capacity of the current system even though MIAEH identified all of Garrett County and parts of Allegany County as medically underserved earlier in the report.

- Comments on this gap could call for:
 - Funding for specialists in the cancers identified so existing primary care providers will be more available to treat patients suffering from other more immediate health outcomes related to fracking.
 - A review of other states’ documented health problems resulting in increased demands for healthcare capacity, including the costs.
 - An assessment of overall unmet health care capacity deficits of the area and how the gas industry could contribute to covering these (i.e. through permitting fees).

Birth Outcomes

MIAEH cites peer-reviewed studies that have found adverse birth outcomes (including congenital heart and neural tube defects) associated with worsening air quality around well pads. However, the report does not include recommendations to address adverse birth outcomes. Establishing a birth outcomes surveillance system is an important recommendation (under cumulative exposure/risk), but it only allows the problem to be documented. No mechanism for preventing adverse birth outcomes is identified.

- Readers may consider commenting on this as an oversight and suggest remedies such as:
 - Including an additional recommendation in the healthcare infrastructure section about providing pre-natal care and pre-conception counseling and/or

- Including a recommendation to increase outreach to pregnant women and women of childbearing age to educate them about potential hazards of fracking and birth outcomes and/or
 - Adding a recommendation that drilling activity be sited at a preemptively precautionary distance from all habitation and human activity until a safe setback distance has been established by research. We note that the recommended setback of 2000 feet has not been demonstrated to be a safe distance.
- Readers may wish to consider whether the potential irreversible lifelong implications of poor birth outcomes is an acceptable risk given that prevention may be difficult.

CHEMICAL DISCLOSURES

Section 12.2 (p.89) includes six detailed recommendations on disclosing information about chemicals and mixtures used throughout the hydraulic fracturing process. MIAEH recommends timely disclosure of classes and amounts of chemicals and chemical formulas being used. The MIAEH recommendations stop short of requiring health effects studies to identify adverse health outcomes that are associated with those chemicals and mixtures.

The proposed BPs written by the Maryland Department of the Environment allow industry the option to claim chemical formulas as trade secrets and MDE would not evaluate the validity of the claim. MIAEH questions the legitimacy of claims of trade secrets and concludes, “Public risk should outweigh commercial concerns especially where the potential risks are created by the trade secret claimant.”

- Public comments can call for the MIAEH recommendations to supersede MDE’s Interim Final Best Practices (BPs) published in July 2014.²
- Commenters may wish to point out the public health value of chemical disclosure laws and call for a policy of disclosing both individual chemical names and chemical formulas, including concentrations of each chemical in the formula.
- Readers could call for:
 - A requirement that toxicological profiles be submitted for each chemical used include potential health outcomes, routes of exposure, reactions with other chemicals used in the fracking process and chemicals commonly found in shale formations
 - Such a requirement would likely spur research into the effects of the chemicals currently in use or industry substitutions of chemicals with known effects that are less harmful.
 - Adequate information on chemicals and mixtures used in the fracking process being disclosed to medical professionals
 - A Maryland ban on non-disclosure agreements so that citizens, doctors, and public health professionals would be able to report all incidents of chemical exposure and evaluate trends in health outcomes related to “fracking” chemical exposures.

Furthermore, MIAEH’s impact assessment is based on available data from other states. But since other states have not required industry to disclose chemicals in use, there is no data to use to predict potential adverse outcomes affecting human health and the environment.

- Readers may wish to point out that this means the extent of the risks and hazards of chemical exposure is not yet known

² http://www.mde.state.md.us/programs/Land/mining/marcellus/Documents/7.10_Version_Final_BP_Report.pdf

- Commenters may specifically point to the legal arguments presented in one of the sources MIAEH cites.³ Excerpts are as follows:

Ten lawyers specializing in intellectual property and trade secrets signed a letter to the Commissioner of the Alaska Oil & Gas Conservation Commission stating the following arguments:

- First, it is a basic principle in a democracy that the public shall conduct informed debate and discussion of public matters. To do this, there must be broad access to data about potential environmental, health and safety (EHS) hazards, even when the disclosure of such information might pose some pecuniary risk to the firms that are introducing the possibility of EHS risks.
- Second, effective environmental management requires broad disclosure of specific data that describes any discharges into the environment—including chemical identity, volume and locations of each chemical discharged – and data on health and ecological effects.
- Third, trade secrecy law should not be used as a means to impede public access to EHS information.
 - Trade secrecy should not impede disclosure of information when the information describes public risks that the trade secret claimant is itself creating
 - There is a case history where confidentiality interests have been compromised or overridden when trade secrets conflict with other values

IMPACTS ACROSS MARYLAND

MIAEH was charged with focusing on the counties that will be directly and immediately impacted if hydraulic fracturing were allowed in Maryland. Aspects of UNGD have current or potential impacts on the health status of Marylanders in other areas of the state. Regardless of whether fracking takes place in Maryland, transport of gas and wastewater from other states will impact our residents. As pipelines are built, truck traffic increases, and compressor stations increase, the health of Marylanders across the state will be affected in ways the MIAEH report has not assessed. These health impacts deserve consideration now.

- Readers may wish to comment on the need for a broader study of the Maryland health impacts of UNGD, with the work of MIAEH serving as the first phase.

COMMUNITY ENGAGEMENT

MIAEH cites a range of opportunities for community engagement. One recommendation would establish a panel of community residents and industry personnel to address odor complaints (R18 on p.91) and noise complaints (R29 on p.94). Odor and noise complaints are not simply nuisance issues, but can be strong indicators of toxicity.

- Readers may want to comment on the role of community members. What would the community gain from having a representative on such a panel? What would the panel gain? Would the community members be compensated? Would they have access to expert medical or scientific advice?

³ https://www.elon.edu/docs/e-web/law/Law_Profs_AOGCC_no_secrecy_in_fracking_letter_040113.pdf

Citizen science provides a new framework for blending local knowledge with traditional science to form conclusions and recommendations. It also places a burden on residents who may be the only ones volunteering their time. Other examples of community involvement can be found in the air quality monitoring recommendations (p.92) and Section 12.7.2 Empower Communities (p.96).

- Readers may wish to reflect on what meaningful community engagement is and whether these recommendations represent opportunities for residents to be heard. How can citizen involvement be conducted in a way that is not burdensome?

SOCIAL DETERMINANTS OF HEALTH

The MIAEH report gives attention to a range of quality of life issues that have been observed in fracking communities and which have direct and indirect health implications. Among these are: increased rates of truck traffic, violent crime, mental illness, substance abuse and sexually transmitted disease (Section 10.3.5 p. 62).

- Readers may wish to comment on whether the recommendations R33 through R39 are adequate for addressing these complex shifts in social factors.

For instance, sexually transmitted infections are expected to increase and the mental health of residents and migrant workers is expected to suffer. However, neither of these subjects is addressed in the report's recommendations. How do we know what will be required to address these anticipated problems? Should the focus be on prevention, or on treatment? Will the health outcomes (particularly STIs and mental health) be the same for migrant workers and residents? If not, should there be different mechanisms in place to help each of these groups?

- Readers may consider comments on these questions and recommendations to improve the social determinants of health in Garrett and Allegany counties.

AIR QUALITY

Research gaps related to UNGD health outcomes have been cited by numerous commentators. Among the gaps highlighted more recently are emerging concerns about air quality and the inadequacy of standard monitoring practices. MIAEH offers recommendations related to air quality that are drawn from traffic related air pollution (a 2000 foot setback from well pads and compressor stations) and suggests broad guidelines for monitoring.

- Public comments could cite the assessment of two reviewers who note differences between traffic related air pollution and that related to UNGD.
 - “While I agree that the bulk of the studies show that traffic-related air pollution declines to background at this distance, the UNGDP process may be more continuous (e.g. compressor stations) and episodic in different ways than traffic from major roads.” (p. 2 of Dr. Adgate’s comments)
 - “The setback recommendation is not unreasonable, but the information presented is not sufficient to feel comfortable with the suggested distance. First, the setback distance will differ for pollutants and source types; traffic gradients will drop off more rapidly than gradients from taller stacks, and pollutants such as ultrafine particles or CO will drop off more rapidly than PM_{2.5}, while ozone could be scavenged in the near field and formed downwind.” (p. 5 of Dr. Levy’s comments)

- Readers might also raise a question about the inconsistencies in evidence supporting a 2000 ft setback recommendation:
 - On page 40, the report states, “Effectiveness of setback was assigned a score of 1 because evidence from traffic-related air pollution studies indicated that the concentrations of traffic-related pollutants drop to the background level beyond 500-700m (1640-2296 feet). Likewise, a study from Colorado reported air pollution levels significantly higher within 0.5 miles (2640 feet) of UNGDP facilities compared to >0.5 miles. Based on this, we concluded that an adequate setback from the corner of a UNGDP facility to the corner of a residential property (2000 feet) can minimize exposure.”
 - With cited evidence of air quality impairment up to 1 km (3280 ft), commenters may question the validity of a 2000 ft setback recommendation.
 - Dr. Levy also makes this point, “...the Colorado study cited as the foundation of the setback recommendation compared samples < 0.5 mile vs. > 0.5 mile, but did not have a strong empirical foundation for the choice of 0.5 miles, used an array of area samples to characterize levels > 0.5 mile, and did not investigate alternative cutpoints. McKenzie et al. state directly that “the actual distance at which residents may experience greater exposures from air emissions may be less than or greater than a 1/2 mile, depending on dispersion and local topography and meteorology”. The authors should be clear that a setback distance adequately protective of air pollution from UNGDP activity has not yet been empirically determined.”

The NIEHS Working Group that published recommendations for research on UNGD in July 2014 listed four types of air quality monitoring and related research that they deem to be needed.

- Readers may wish to cite this report’s recommendations in contrast to MIAEH’s. It can be viewed at: <http://ehp.niehs.nih.gov/1408207>

RESEARCH GAPS

The MIAEH group addressed many potential hazards and health outcomes associated with unconventional natural gas development, but also named additional areas where more research is needed before conclusions can be drawn about health outcomes. Additional research gaps unnamed by MIAEH also exist.

- Readers may wish to comment on some or all areas of future research – both those cited by MIAEH and those MIAEH omits:

Topics named by MIAEH

- Birth outcomes
- Water quality
- Endocrine disruption (mentioned in a few sections, but not explicitly as a research need)
- Critical demand on health infrastructure
- Healthcare costs
- Waste disposal (brine, flowback mixtures, and radioactive waste)
- Assessment of radiological contamination

Topics omitted by MIAEH

- How will MDE finance enforcement of both MIAEH recommendations and MDE proposed best practices

- Impacts on integrity of food sources, including possible toxic exposures of production animals and wildlife (hunting being a source of food supply)
- System for incident reporting
- Waste disposal tracking (to address illegal dumping)

Finally, the biggest question faced by the public health community is that of coping with unknowns. UNGD is a still relatively new and growing industry. In the rapidly evolving field of research about its health effects, we can be sure there are threats and risks that have not yet emerged and/or been studied.

For Maryland policy-makers, we must ask: How do we address what we don't know that we don't know?