

Minutes of May 16, 2014, meeting of the Marcellus Shale Safe Drilling Initiative Advisory Commission

Approved: June 13, 2014.

The Commission held its 28<sup>th</sup> meeting on May 16, 2014, at Frostburg University beginning at 10:00 am. In attendance were Chairman David Vanko and Commission members Senator George Edwards, Commissioner James Raley, Commissioner William Valentine, Mayor Peggy Jamison, Shawn Bender, Ann Bristow, Steve Bunker, Paul Roberts, and Nick Weber. Attending by conference call were Commissioners Jeff Kupfer, Cliff Mitchell, and Harry Weiss. Secretary Bob Summers and some members of the public also attended by conference call. Staff of state agencies and members of the public were present.

Chairman Vanko called the meeting to order. The revised draft minutes of the April meeting were approved as revised.

The first agenda item was a report by Dr. Daraius Irani of the Regional Economic Studies Institute. His presentation identified the assumptions made in the report and summarized some of the conclusions regarding community impacts and economic and fiscal impacts. The full report will be released in final form sometime later in May. During a question and answer period, Dr. Irani made the following points:

- The report includes a table of truck trips that reflects trips only by trucks carrying loads. If one wanted to count trips by empty trucks, these numbers would be doubled. The truck trips do not include trips for refracking. If it occurred, refracking would result in another wave of truck trips.
- The report did not consider waterless hydraulic fracturing.
- What data existed on tourism trends in areas where shale gas drilling occurred were not very useful because it was not possible to separate out the effects of the economic recession that occurred at the same time. The impact on tourism will probably be heavily dependent on the pace and scale of drilling. If there is an actual or perceived impact on the environment, one would expect tourism to be affected.
- The tourism section of the report is more qualitative than quantitative. He would like to suggest more work on this topic, but the data aren't there and may not be there in the future. In his opinion, there is sufficient information on tourism to support an informed judgment.
- The tables on jobs show predictions through 2036. Garrett County shows some job loss in some years; that is, when the gas industry jobs decline and disappear, the net in some years is a loss of jobs. This reflects jobs that were not created because resources were devoted to the gas industry and the fact that the workforce was tied up in a business that experiences a "bust" after the "boom."

- Many things could alter the future, including changes in the price of gas and changes in technology.
- The tables of economic impact he showed did not include severance taxes, but the report shows the total direct and indirect economic impact from shale gas development.
- The impact on real estate values depends on the proximity to well sites.
- The models show a boom and bust cycle, but the models do not predict that the drilling scenarios ever result in less economic activity than the “no drilling” scenario.
- The report does not predict a decline in housing values in the Deep Creek Lake area, largely because, based on zoning and setbacks, there will be no well pads in the vicinity of the lake.
- In response to requests from several Commissioners that the current economic activity and tax revenue in Garrett and Allegany Counties be included in the report, Dr. Irani indicated he would add information on baseline taxes and economic activity.
- The numbers in the report are net impacts; it is not possible to separately quantify the impact on tourism from the impact of gas development. Nor will the report identify the distribution of the impacts.
- Getting data on the impact of tourism would require original research, including surveys to determine why people decided to spend time (or not spend time) in an area where drilling occurred.
- The schedule calls for RESI to deliver the final report to MDE on May 23.

Because the discussion with the Commissioners on the economic study had consumed so much time, the Chair declined to allow questions from the audience.

The next agenda item was a presentation on the management of naturally occurring radioactive material (NORM) and technologically enhanced naturally occurring radioactive materials (TENORM) in drilling wastes by Edward M. Dexter, P.G., Administrator of MDE’s Solid Waste Program. During and following his presentation, in questions and discussions with Commissioners, Mr. Dexter made the following points:

- NORM and TENORM are not federally regulated; regulation is left to the states.
- In Maryland, solid waste landfills permitted to take municipal waste can accept NORM and TENORM.
- The design and operational requirements for municipal solid waste landfills are adequate to handle NORM and TENORM.

- NORM and TENORM are expected to behave similarly to municipal wastes in landfills. Groundwater monitoring of standard contaminants would reveal a release from a landfill, whether the release was of radioactive material or normal municipal waste, so there is no reason to add parameters to the monitoring. If shale gas drilling occurs in Maryland, the State could add monitoring parameters to the landfill permits, which is simpler and faster than changing the regulations.
- Maryland landfills are not required to screen incoming wastes for radioactivity; some do and can refuse to accept radioactive material.
- In response to a question, Mr. Dexter said that he does not know whether the Allegany County landfill, which is operated by a private company, has accepted any out of state drilling wastes. He will find out.
- With a few exceptions, the State does not monitor for gross alpha or gross beta activity at landfills. The State could require landfills to conduct baseline for radioactivity.
- The State is paying attention to ongoing studies and to developments in other states and is prepared to act if the evidence warrants controls.
- In response to a question about the use of depleted uranium in perforation guns, Mr. Dexter agreed to look into the issue.
- Mr. Dexter said he does not know how effective wastewater treatment plants are at removing radioactive particles. Ms. Kenney mentioned that EPA is developing pretreatment regulations for oil and gas wastes. Commissioner Weiss noted that the exemption of oil and gas exploration and production wastes from federal hazardous waste regulations would not apply to the residues from pretreatment or the leachate from landfills.

Following a lunch break, Tad Aburn, Director of MDE's Air and Radiation Management Administration, gave a presentation on air pollution and Marcellus shale gas drilling: current thinking on regulatory requirements. He described the concept of top-down best available control technology (top-down BAT), whereby the applicant considers all technologies and eliminates only those for which the costs are high and the benefits low. He also discussed the possibility of a zero methane requirement, with offsets for residual methane emissions.

During and following his presentation, in questions and discussions with Commissioners, the following points were made.

- MDE would consider both forward looking infrared (FLIR) and near infrared spectroscopy in monitoring.
- He thinks offsets, e.g., reductions from reforestation, will be available for purchase.

- MDE will ask operators to quantify their own emissions, but MDE will follow up with sampling to validate. Mr. Aburn cautioned, however, that quantifying fugitive emissions is very difficult.
- There will be emissions from the Dominion liquefied natural gas export terminal at Cove Point if it is built. The Greenhouse Gas Plan will have to factor in those emissions. Mr. Aburn noted that a progress report will be presented to the General Assembly in advance of the 2016 session and that the legislature could make changes could be made at that time.
- He is not able to say whether the proposed Cove Point export terminal will affect natural gas prices or the pace of high volume hydraulic fracturing.
- In response to a question about how “green” green completions are, Flint Webb of Leidos said that the equipment and process must be approved by the regulators and incorporated into the permit. The equipment is portable and there could be green completion vendors going from site to site. The goal is to separate the methane from liquids and solids during the initial period of high-rate flowback so the methane can be captured instead of flared.
- Top-down BAT allows the State to require new technology as it becomes available.
- Mr. Aburn said he was not sure whether the regulations requiring top-down BAT and methane offsets would be in MDE’s air regulations or the oil and gas regulations.
- In response to an observation that different air toxics are produced at different stages of the well drilling and development, and a question about whether it would be possible to tailor best practices to each toxic chemical and each pathway, Mr. Aburn said that this would be addressed by top-down BAT and that under the air toxics program, the list of toxic chemicals is open-ended. He invited interested persons to participate in a stakeholder process to help develop the regulations.
- The monitoring that NETL is doing and the monitoring station at Piney Run measure daily averages and establish pre-drilling baseline. They do not measure intense peak exposures. Gas chromatography is the most temporally refined monitoring method, and FLIR gives immediate results. Sensor technology continues to improve. It may be possible to train citizens to take samples. The control strategies and the 1,000 foot setback from residences should moderate short term, high level exposures.
- A Commissioner took issue with a statement on the slides that air emissions from operations following BMPs will likely not endanger public health because technological and regulatory advances have significantly reduced pollutant emissions in recent years, and that data from recent air monitoring studies of well controlled Marcellus operations using the most sensitive monitoring techniques show concentrations well below health

effects levels at 1000 feet. Another Commissioner said the many lawsuits filed alleging damage from drilling more than 1,000 feet away lead him to believe that a 1,000 foot setback is not acceptable. The statements were based on the Leidos reports, but the Leidos researcher responsible for that part of the report was not on the conference call and so was not available to clarify. Mr. Webb of Leidos said that the Pennsylvania data would be more relevant than data from Texas or North Dakota. For example, in the Barnett Shale in Texas, the product contains a significant amount of liquid hydrocarbons, so there will be constituents that you won't see in dry gas. Dry gas will have fewer air toxics. Various government agencies are conducting monitoring, including the Pennsylvania Department of Environmental Protection. These data will improve our understanding.

- Commissioner Bristow read from page 8 of the Shonkoff et al. (2014) article: "Further, the mixing of these compounds under conditions of high pressure, and often, high heat, may synergistically create additional, potentially toxic compounds (Kortenkamp et al. 2007; Teuschler and Hertzberg 1995; Wilkinson 2000)." Commissioner Bristow also made the point that methane can contribute to ground level ozone.
- Mr. Aburn said that Maryland's goal is not consistency with other states, but that Maryland will be more stringent and raise the bar. Mr. Aburn said that the State would be interested in receiving any information the Commissioner had, and encouraged him to send it to him.
- MDE would consider the topography and the possibility of inversions in air toxics reviews.

The next agenda item was a presentation updating the Commission on the risk assessment, by Matthew Rowe, Deputy Director of MDE's Science Services Administration. Mr. Rowe said that the risk assessment was underway. The process and framework were set out in the work plan presented to the Commission in 2013. He described some of the assumptions, such as the drilling scenarios, the number of wells per pad, the disturbed area associated with each well pad and the number of truck trips. The intention is to present the risk assessment in a form that can be readily understood, with details given in technical appendices.

During and following his presentation, in questions and discussions with Commissioners, the following points were made.

- The schedule to provide a draft report in June is ambitious.
- The risk assessment will consider individual and cumulative effects.
- The risk assessment will consider the potential harms, identify the pathways or sequence of events that could lead to that harm, and consider how the best practices will affect risk.

- The team doing the risk assessment will consider the most recently recommended best practices; if these change, the risk assessment can be revised.
- A Commissioner suggested that the risk assessment be peer reviewed and posted for public comment.

Following a break, MDE staff Brigid Kenney referred to a memorandum that had been circulated to the Commissioners about likely changes to the draft best practices in the areas of the Comprehensive Gas Development Plan (CGDP); location restrictions and setbacks; chemicals, trade secrets and disclosure; air emissions, and well casing and cement. The changes to the CGDP and the location restrictions had been discussed at the April meeting; one additional change was noted to the setback from private drinking wells, requiring consent to reduce the setback from 2,000 to 1,000 feet. She then summarized the changes to the other areas. During questions and discussions with Commissioners, the following points were made.

- There was a mistake in the memo in that the requirement that information be available 24/7 was erroneously deleted.
- A Commissioner said that the amount of each chemical used should be reported by volume as well as weight. Ms. Kenney said there were conversion factors.
- Commissioner Mitchell said that he had met with Craig Lowry, Deputy Commissioner, Division of Labor and Industry, who heads the Maryland Occupational Health and Safety (MOSH) division of the Department of Labor, Licensing and Regulation to discuss MOSH's experience with trade secrets. Mr. Lowry said that MOSH has always been able to get the trade secret information from companies under provisions similar to those MDE is proposing.
- There is a concern among the medical community that signing a confidentiality agreement might subject them to a suit if the information were somehow released or the owner of the trade secret thought that the disclosure violated the agreement. This would have a chilling affect on medical practitioners.
- A Commissioner noted that the draft best practices report allowed the medical practitioner to contact MDE to get the trade secret information; the new proposal is that the practitioner would contact the company. Will this place an undue burden on the physician? Other Commissioners said that the information is generally available from third party providers 24/7, and that a physician would almost certainly get the information faster from the company than from MDE.
- A question was raised as to whether the provision that would allow any health professional, toxicologist or epidemiologist who is employed in the field of public health and has a need of the chemical information for public health purposes is broad enough to allow researchers to obtain the information and publish the results of the research. It

was noted that “the field of public health” is broad. Also, the researcher might be able to publish information about the chemical without publishing the product name. Commissioner Mitchell said that publication of the results is a nuanced concern, and may depend on whether there is an overriding public health interest.

- A Commissioner questioned whether the disclosure provisions are fair, especially since it would apply to a single industry. He opined that this was beyond the “gold standard” and that these provisions may not survive the process of promulgating regulations
- A Commissioner questioned whether this would be a “deal breaker.” Ms. Kenney noted that one of the principal suppliers of additives for hydraulic fracturing had recently announced that it would, in the future, disclose all the chemicals in its formulations, without linking the chemicals to any specific product it sells. This is similar to the Maryland proposal.
- Another Commissioner said that the industry thinks that trade secrets should be protected and that medical personnel should have access to the information. He cautioned, however, that while no one regulation might be a “deal breaker” industry would consider the practicality of proceeding under the entire array of regulations Maryland might propose.
- The issue of estimating emissions was raised again. Ms. Kenney noted that there are recognized methods for estimating fugitive emissions.
- A Commissioner noted the lack of information on refracturing and how refracturing would impact air emissions and casing and cement failures.
- A Commissioner said that he thought top-down BAT had a lot of “wiggle room” and that a company could easily claim a control technology was too expensive to justify the emission reductions. Ms. Kenney noted that the Department has some experience with top-down BAT and would require that the company support its claim.
- Based on the Ingraffea and Vengosh presentations, and upon further consideration, the casing and cement plan requirements have been clarified and strengthened because casing and cement is the first line of defense to prevent the escape of methane.
- A Commissioner asked if the requirement of cementing the production casing at least 500 feet above the target formation is an API standard. Ms. Kenney said that it was a recommendation.
- In response to a question about how one would know whether the casing and cement are still intact after perforation and hydraulic fracturing, Ms. Kenney said that integrity testing is initially done at a pressure higher than the pressure of hydraulic fracturing and that it can be repeated before refracturing. Another Commissioner noted that

perforations are brief and localized; they do not exert pressure through the entire borehole. The State would receive copies of the logs and tests.

- Commissioner Roberts asked for a written response to his May 7, 2014 email in which he asked the State to clarify what he saw as ambiguities regarding the State's view of the research of Dr. Vengosh and others at Duke.
- Two Commissioners asked whether the proposed provision that would allow the owner of a private drinking water well to consent to the location of a drill pad between 1,000 and 2,000 feet of the private well, provided a hydrogeological study demonstrated that the well pad was not upgradient of the private well, might be unconstitutional under the analysis offered by the Attorney General on a law that related to adjoining property owners' consent to a variance for a setback requirement for wind turbines. Ms. Kenney said she did not think so.
- A Commissioner gave the opinion that the State should not require 2 years of baseline data for an exploratory well. If the exploratory well produces a commercially valuable amount of gas, the State should allow it to be connected to a pipeline immediately, and not delay it until a CGDP is approved.
- There was discussion about whether exploratory wells would need to produce gas for a time in order for the operator to gather data, which after all, is the purpose of an exploratory well. Apparently the time period is not the same for every well. If no pipeline is available, it might be necessary to flare the gas or vent it to the atmosphere unless a temporary pipeline could be used. This topic will be discussed at a future meeting.

A public comment period followed.

- Rebecca Ruggles, Director of the Maryland Environmental Health Network, made the following points:
  - Air pollution is emerging as the most important public health issue. She welcomes Mr. Aburn's stakeholder process on the air regulations. She asked if this stakeholder process would be separate from the Advisory Commission's work. She was told it would be separate.
  - She has a concern that requiring a confidentiality agreement before disclosure of trade secrets will have a chilling effect on medical practitioners and researchers.
  - Medical professionals need to know the concentration of chemicals, not just the identity of the chemical.
  - The disclosure provisions based on public health should be clear that research is included.



- She is concerned about explosions, spills and other accidents, and whether the emergency response personnel are adequately equipped and trained to respond. It was mentioned that the Advisory Commission discussed this at the February meeting, and that the Garrett County Shale Gas Advisory Commission had also discussed emergency response.
- Could setbacks be changed if the public health report supports changes? She was told yes.
- She wants to make sure Mr. Aburn is aware of the silica issues. She understands that Leidos evaluated pollution levels on site, not those blowing off-site.
- Could Mr. Dexter investigate and report back on the landfill in West Virginia that accepted NORM and then detected radiation in its leachate? Are Maryland's landfills designed differently from the West Virginia landfill?
- Commissioner Roberts noted that the Pennsylvania DEP had just issued a [report](#) on the effectiveness of its program for protecting state forests. He said that the conclusion was that it was too early to tell.
- Paul Durham asked whether downstream infrastructure would be considered in the Risk Assessment. The answer was no, although it could be considered in the air emissions regulations. Groundwater will be considered in the risk assessment.
- Dave Nard urged the Commission to consider the fact that new chemicals might be created during hydraulic fracturing under conditions of high pressure and temperature. Chairman Vanko noted that research is being conducted to identify reaction products of concern, and that the State would act on that information. Ms. Kenney said that proper handling of the wastewater is critical, and that the best practices are designed to handle wastewater. Mr. Nard is concerned about many contaminants, not just methane. He wonders where in the gas preparation process radon, uranium isotopes, and other contaminants would be removed from the gas?
- A public health [report](#) by Shonkoff was published in mid-April.
- Eric Robison expressed frustration at the level of public participation allowed at Commission meetings. He feels that the staff takes an adversarial position with him and other members of the public. He thinks the public should have the opportunity to ask questions and have discussions with the presenters and the Commissioners during meetings. Chairman Vanko indicated that public input is important, but that it is a challenge to make the best use of the time available for Advisory Commission meetings.
- Commissioner Weber said that materials are circulated shortly before the meetings and he feels he does not have time to digest them. He feels that at meetings, he is responding "on the fly."

- Woody Getz said that citizen participation is important so that everyone gets to a common “truth.” He also said that he appreciated Mr. Dexter’s presentation on landfills.
- Elizabeth Hoffman asked how the CO<sub>2</sub> equivalents of methane would be calculated, since the greenhouse gas impact of methane is different depending on what time scale is used.
- John Quilty said that he chairs the Garrett County Shale Gas Advisory Committee, and that his committee has the same challenges with public participation. He also said that he strongly favors release of the final best practices report so the public can see it. Lastly, he asked if the concept of top-down BAT might be applied to other aspects of well permitting, especially casing and cement.
- Megan Jennings applauded the zero methane emission approach, but said that she was concerned about the State’s ability to enforce it.
- Derek Johnson asked if the economic study will be posted when it is final. He was told that it would be posted on MDE’s Marcellus Shale website.
- Commissioner Valentine said that he thought the RESI estimates for economic growth in Allegany County were very different from those of the Maryland Department of Planning, and asked that RESI check that.
- A resident of Allegany County observed that EPA has been sued many times over BAT regulations. Is MDE concerned? Ms. Kenney answered that the proposed top-down BAT would be handled through the permit process and that MDE had had good experience in implementing BAT.
- Nadine Grabania (participating by conference call) said that she didn’t understand why an exploratory well would be necessary in Maryland if gas wells had already been drilled just a short distance away in Pennsylvania. Isn’t there enough information already? She also asked what the difference was between wind turbines and gas wells that might make the Attorney General’s advice on the constitutionality of landowner consent to waivers of setback requirements inapplicable to gas wells. Ms. Kenney said that she would review the Attorney General’s letter.

The meeting adjourned about 4:00 pm.