Written Comments of Delegate Tim Manchin, House Chairman of the Joint Select Committee on Marcellus Shale to Senate Committee on Energy & Natural Resources.

Introduction

The emergence of the horizontal drilling methods along with the development of new shale fracturing techniques have generated a boon for gas drillers and a potential windfall for mineral owners in the Marcellus shale region, and a potential huge influx of severance taxes and associated economic benefits for the state. West Virginia stands to gain greatly from the development of Marcellus shale gas including benefitting from the jobs and taxes associated from development of these wells, corresponding distribution infrastructure, and hopefully post production industrial uses. However, the boon does not come without costs and impacts to the state and its citizens and environment in the communities where these operations are being undertaken. We have been hearing from impacted citizens and other citizens from across the state who anticipate what the future holds as this new activity appears where they live in this state. These citizens have been letting us legislators know in a loud and clear voice that they expect us to fairly regulate these activities and also represent the vast numbers of citizens in this state who are or will be directly impacted by this emerging industry.

This new drilling process has not been experienced before in West Virginia and the regulatory scheme for traditional drilling methods is clearly insufficient to address the impacts to local communities, the environment, infrastructure and regulatory enforcement. The moving target of emerging technologies has caused a steep learning curve for regulators and lawmakers who have been trying to sort through this important issue. I have been frustrated by the unwillingness of the industry, with the exception of a few, to be forthcoming in developing this regulatory scheme. The West Virginia Oil and Natural Gas Association and Independent Oil and Gas Association of West Virginia have been disappointing in their failure to engage in constructive dialog regarding the issues raised by this our efforts to reach reasonable solutions to the problems these new operations present to our state. This has been a two year process of attempting to forge a reasonable regulatory program while being sensitive to impacts of these proposals to the gas industry, surface owners, local communities and for the broader interests of the state of West Virginia.

This testimony is intended to provide this Committee a brief history of the efforts undertaken by the West Virginia Legislature the last two years to develop a regulatory scheme and my commentary regarding the issues under consideration by the Joint Select Committee on Marcellus Shale.

I. 2010 Interims and 2011 Regular Session

A. 2010 Legislative study.

During 2010, a study was undertaken and legislation was drafted by a Subcommittee of the Joint Judiciary Committee of the West Virginia Legislature. The Subcommittee proposed legislation for consideration during the 2011 Regular Session to provide a regulatory scheme for these large drilling operations. The bill also addressed local concerns by addressing protections for surface owners, local environmental impacts and protection of roads. This bill was recommended for introduction in December 2010 and introduced on January 26th, 2011 [H.B.2878].

B. Department of Environmental Protection [DEP] proposal

The DEP held a series of meetings with interested parties through the summer and fall of 2010 and developed its own legislation which was introduced on February 2nd, 2011. This bill [S.B. 424 & HB 3048] addressed several regulatory aspects of horizontal drilling and water use. The bill provided new specific regulations but did not address items outside of the DEP's regulatory duties, and things such as providing protections for local land owners and consideration of local impacts were not addressed. This bill was generated without input, participation or coordination with the Legislature.

C. 2011 Regular Session

After several public meetings and hearings by the Judiciary and Finance Committees, and considerable work by a subcommittee of the House Judiciary Committee, HB2878 was reported out of both the House Judiciary and House Finance Committees with overwhelming support. However, the bill was not advanced on the House Floor for a vote on third reading.

The Senate Committee on Mining and Industry jettisoned the DEP proposal contained in S.B.424 and generated a committee substitute which established minimum regulatory standards and did not address several of the issues of the House proposal. As a result it became quickly apparent that there was much disagreement between the two houses as to what a final bill should look like. S.B.424 was reported out of the Senate but did not pass the House prior to adjournment.

Summary of differences between the House and Senate proposals at the end of the 2011 Regular Session:

House and Senate versions *both* addressed:

Requiring road maintenance agreements with Dept of Highways;

Special requirements for construction of large marcellus impoundments;

Increased notice to property owners;

New permitting and regulatory program created in new Article 6A;

Providing that local governments are preempted by the state law, except for traditional zoning regulation;

and

Extending current public comment process 15 days for all wells, to 30 days for Marcellus wells.

PERMIT FEES: Senate permit fees of $5,000 for first and $1,000 for subsequent wells on same pad. House directed the DEP by rule to establish permit fees for horizontal shallow wells.

Senate version applied to all horizontal wells, while House applied to "horizontal shallow wells that use 210,000 gallons or more of water."

Both versions required soil and erosion management plans. The Senate draft required a safety plan for drilling operations be adopted, while the House required a study and report on safety concerns. Both versions established large impoundment construction and management requirements. Several differences existed in the two versions relating to impoundment requirements.

Senate Water protections:

Rebuttable presumption for water rights civil actions within 1,000 feet of the well site;

Provide protections for karst formations;

Require a water management plan if the well uses more than 210,000 gallons of water; and

Require study of whether rules need to be developed for greater regulation of water use and management.

House Judiciary/Finance amendment to SB424:

House Committee Water protections:

Well prohibited within 1,000 feet of a well or public water intake;

No well within 100 feet of a water course or wetland; and

Mandatory water management plan requirements, applicable to all shallow horizontal wells, with specific water withdrawal and frack water management requirements.

Requirements that the DEP consider well impact to public resources such as parks, wildlife areas, scenic rivers, and historic places. Special requirements provided for drilling near high quality naturally occurring trout streams.

House provided special requirement for well construction inspections to assure proper cementing of well casings has been verified.

Additional House provisions:

Prohibiting construction of a drilling pad on a surface owner when pooling agreements are utilized without surface owner consent.

Reporting to the Legislature from DEP and state universities to see if further regulation is needed for: worker safety standards for these large operations; whether radiation is being released into the fracking water during the drilling process; whether there are new air pollution problems associated with these drilling operations; whether enhanced water disposal requirements are needed; if there are Karst formation leaking/impacts; and a report on number of DEP inspections and inspectors. Studies with annual reporting requirements and a July 2016 final report date.

Requiring the operations to be drug free work places.

Timber to be valued at a minimum of two times the value of the present appraised value.

Repeals the Oil and Gas Inspectors Examining Board, allowing DEP to hire inspectors in the same fashion it hires all other inspectors.

II. Creation of Joint Select Committee on Marcellus Shale

The Speaker and Acting President created the Joint Select Committee on Marcellus Shale in June of this year to study and draft legislation that would have broad based support in the Legislature. The Committee is made up of five Senate and five House members.

A. Select Committee monthly meetings

Beginning in July of this year the Committee has been meeting regularly to hear testimony, review legislation and consider amendments. We agreed to begin working from the Senate bill as a regulatory framework and to consider each proposed amendment individually to allow for debate and discussion, and hopefully reasonable compromise. The House members proposed over 20 amendments to the bill. These amendments (with the exception of a few which were revised or offered later)were published and remain on the WV Legislature web page since August 17th 2011. At that time a letter was send to gas industry groups and businesses and other interested parties soliciting comment and reactions to the proposed legislation and pending amendments. The industry and others responses to this request are attached to these comments. The Committee has diligently worked each amendment and many of these proposals were amended and adopted by the Committee and represent reasonable compromises to these areas of concern. Each amendment adopted and pending before the Committee has and continues to be available at www.legis.state.wv.us.

Interest Groups and stakeholders

During the months of study of this issue the Committee and individual legislators have heard from a variety of parties and interest groups regarding this legislation. These include surface owners, residents living near drilling operations, environmentalists, mineral owners, watershed groups, the oil and gas industry, municipalities and counties and their associations, labor groups, local law enforcement officials, the Division of Highways, and regulators.

B. House Members public hearings

The House members of the Select Committee held a series of public hearing around the state to receive input from affected communities. These meetings took place in Wheeling, Morgantown and Clarksburg. The purpose of these meetings was to invite public comment and suggestions regarding the Committee's consideration of legislation that would regulate the horizontal gas well drilling. The first public hearing was held on July 21, 2011 in Wheeling, WV at the West Virginia Northern Community College. Approximately 38 individuals addressed house members to voice their views about gas well horizontal drilling and approximately 75 individuals were in attendance for this hearing. The second public hearing was held on July 25, 2011 in Morgantown, WV at the West Virginia University School of Law. Approximately 74 individuals presented with well over 100 individuals in attendance. The final public hearing was held at the Robert C. Byrd High School in Clarksburg, WV on July 27, 2011. Approximately 128 individuals spoke and over 500 individuals were in attendance. In sum, over 240 members of the public and industry addressed the House members. Additionally, over 700 attended these public hearings and submitted hundreds of documents, in writing, to support their respective positions. All submitted documents, attendance records and recordings of each of these public hearings are on file with the Committee's Clerk and I will be glad to make them or a portion of them available to this committee upon request.

The discussions at all three of these public hearings essentially mirrored one another. The gas industry employees, operators and lobbyists, which were generally the only speakers to speak in favor of the industry, took the position that drilling horizontal gas wells into the Marcellus Shale formation is essential to the economic growth of our state and the creation of employment opportunities for our residents. Additionally representatives of the gas industry, particularly at the Clarksburg hearing, took the podium to support this assertion and to stress the importance of their industry. They also stated that there was no factual evidence that current hydraulic fracturing has caused any deaths, illness, pollution or damage to surface owners' drinking water or the land and air in general.

Alternatively, the comments by those supporting more stringent regulation of the horizontally drilled gas wells varied greatly, but generally expressed concerns about community impacts. These speakers represented a wide variety of concerned citizens such as local residents, environmentalists, academics, and adjoining property owners regarding the need for legislation that strikes a reasonable balance between economic development/job creation and protection and consideration of the local residents who are absorbing the adverse impacts of these operations. Their areas of concern include:

significant road use by large trucks in rural areas not accustomed or designed for such traffic, air pollution from machinery at the well site and from waste impoundments, protection of drinking, surface and ground water, surface owners' protections, the need for a safe distance from these operations to residences, the right to use and enjoy their land as intended, noise pollution, impacts to local towns and cities at or near well sites, adequate permitting requirements and fees, property devaluation, management of large water and waste impoundments, and effective well inspections. Several speakers advocated a moratorium on further drilling until a proper regulatory scheme is in place. With the exception of one circumstance where a lobbyist for the industry attempted to disrupt a hearing by provoking a breach of decorum, the participants at these hearing were respectful and attentive.

C. Amendments Adopted by Committee

1. Information to accompany permit application.

A. Filing of directional drilling information.

The current information to be included in a drilling permit application was designed when vertical wells were the only types of wells that were being drilled. Currently, the direction and length of the proposed horizontal lateral is not reflected on any submitted plat, and the proposed directional drilling information is not required to be included with the application.

There is a need to identify the direction and length of the well's proposed and constructed laterals for a variety of reasons. The location of the laterals helps identify the areas and properties from which gas production is to be stimulated, and the location of other surface and subsurface structures in relation to the entirety of the drilled borehole. The ability to locate the proximity of the proposed borehole and laterals to other prior drilling activity and abandoned wells is necessary to protect against unanticipated migration of gas or potential hazards while drilling the horizontal laterals. Reliable as-built mapping of these horizontal sections will also be increasingly important as additional laterals or vertical sections are drilled through the well's completion zone.

For these reasons, the amendments recommended by the Committee would require that the projected directional drilling information be included as a part of the permit application.

B. Karst Formations

An amendment pending before the committee will require an assessment and certification from the permit applicant that no karst formations, which are generally sandstone formations which tend to have large cracks and can serve as a conduit for frack water into groundwater, are not impacted by the drilling operations. These formations only exist in certain regions of the state, and this amendment is intended to assure that there are no impacts to these formations.

2. Notice of permit application.

A. Notice to specific groups of affected individuals/property owners.

Under current WV code, the only classes of people who are provided with notice of a natural gas well drilling permit application are:

1. The owners of record of the surface tract where the well is to be located;

2. The owners of record of a surface tract where land would be disturbed or owners of a surface tract to be utilized as roads to the proposed well site; and

3. Coal operators or other owners of coal interests for any coal seam known to underlie the tract where the well is to be located.

After hearing the additional concerns expressed by the other property owners whose ability to utilize and enjoy their property interests would be potentially impacted by a large horizontal drilling operation and hydraulic fracturing, the Committee has proposed by amendment to add the following categories of persons to receive individual notice of the permit application:

4. Surface owners of any tract of land which is immediately adjacent to a tract where well work is to be conducted or other land disturbance is to occur;

5. Any surface owner or water purveyor who is known to have a water well, spring or water supply source located within 2500 feet of the center of the proposed or existing well pad, when the water from that supply source is used for consumption by humans or domestic animals.

Each of the individuals receiving individual notice of the application would receive a copy of the application, the well plat setting forth the location of the well and the roads and appurtenances to be established for the well, and the well's erosion and sediment control plan.

B. Public notice requirements.

Under the current provisions of the West Virginia Code, public notice is not required of a proposed shallow gas well or a proposed deep well. It only provides an alternative for the applicant to provide a Class II legal ad as an alternative to providing individual notices to a surface tract which is owned by three or more tenants in common. The current provisions of the West Virginia Code require that public notice be provided by a Class II legal ad (2 consecutive weeks) for a proposed coalbed methane well.

The public concerns regarding the impact of horizontal well drilling on large multi-well pads and the stimulation of the gas production by hydrofracturing with large volumes of water are much more significant than the issues normally associated with traditional vertical wells and other drilling activities conducted on a much smaller footprint. Therefore, the Committee found it reasonable and appropriate to establish a mechanism to provide for public notice and comment for proposed

horizontal well permit applications which proposed to utilize more than 210,000 gallons of water over a 30 day period or require a drilling footprint of 3 acres or more on the surface.

Under the provisions reflected by the Committee's adopted amendment, the public notice is to be provided by a Class II legal ad, with the first notice to be provided at least ten days' prior to the filing of the application. The public may file public comment for a period of thirty days 30 days after the filing of the application, and the public comment period can end no sooner than 30 days after the second published notice.

3. Review and consideration of comments, objections and protests.

The DEP (Office of Oil & Gas) is to review all comments, protests and objections that are filed in response to a permit application.

Under the amendments proposed by the Committee, the character of all objections, comments and protests received to the application are to be provided by the DEP to the applicant within 15 days of the close of the public comment period, or 45 days after the date of the permit application, whichever is later.

Objections filed by owners of coal interests will continue to be reviewed and considered by the DEP or by the Shallow Gas Board, as provided by the current statutory framework. That current statutory framework provides a mechanism for the applicant and the owners of the coal interest to agree on any changes or alterations of the application by agreement, or submit the dispute for hearing or resolution. A hearing on the coal owner's unresolved issues are initially heard by the Shallow Gas Review Board for shallow wells, and by the DEP for deep wells.

The proposed amendment would similarly allow the applicant and the objecting surface property owners and water purveyors to agree on an alternate location or agree on the conditions under which the drilling is to take place, subject to approval by the DEP.

The amendment would provide the DEP with the discretion to conduct a public hearing on the permit application, if it so desired. The DEP would be permitted to identify and narrow the issues to be addressed at any such scheduled public hearing. At the close of the comment period the DEP would provide notice of the public hearing by Class I legal ad. This public hearing would have to be scheduled and conducted within thirty days after the close of the comment period. Any person may submit a written or oral statement for the Secretary's consideration. However, the only parties allowed to file testimony or documents for consideration at the public hearing would be the proposed well operator, those receiving individual notice of the permit application, counties or municipalities where the activity is to be conducted, or other parties who are specifically granted intervener status by the DEP.

4. DEP authority to conduct a public hearing on horizontal permit issues:

While the DEP had a clear statutory authority to conduct public hearing to address related objections raised by owners and operators of an underlying coal seam, the current statutes did not provide a clear mechanism for the DEP to conduct a public hearing on other issues associated with a horizontal drilling permit application. The Committee's proposed bill, as amended, would provide that clear authority to the DEP. The DEP's decision to conduct such a public hearing is purely discretionary, and the DEP may identify and limit the scope of the issues to be addressed at the hearing. Any such hearing is to be conducted promptly and in such a manner which would not unreasonably delay the DEP's ultimate decision on the permit application.

5. Predrilling water supply testing/ presumptions:

Under current West Virginia law, in any cause of action brought for the contamination or deprivation of a fresh water source or supply, if the fresh water source or supply is located within 1000 feet of a drilling site for an oil or gas well, there is a statutorily created rebuttable presumption that the oil or gas well was the proximate cause of the contamination or deprivation of the fresh water supply source. At the time this standard was developed, all oil and gas wells were drilled as vertical wells, and there was no horizontal drilling.

Currently, all surrounding surface owners within 1000 feet of a permitted well are provided with notice of the opportunity to have a predrilling survey conducted at the operator's expense before drilling is commenced under an issued permit. This provides both parties the opportunity to have a baseline study conducted to protect their respective interests.

Opponents of horizontal drilling and hydraulic fracturing are concerned about the prospects of drilling fluids and fracking fluids potentially contaminating freshwater supplies which lay overtop of the stimulated zones. They are also concerned that if a well is not properly cased and cemented before hyrdrofracturing stimulation is performed on the well, then zones and formations above the targeted completion zone may be inadvertently injected with contaminants and fluids, which could migrate into the water supplies over time.

While industry experts assure the Committee that the prospect of such a scenario is highly unlikely, there is frankly a lack of scientific data to confirm the existence or absence of such contamination. Methane may naturally leach into freshwater supplies, and certain contaminants may be found in the water as a result of other natural or manmade occurrences. The best means for evaluating the impact of any prospective drilling activity on a water supply is by conducting reasonable and sufficient baseline testing in advance of the drilling activities, and comparing those results to samples taken from the same water supply source sometime after the drilling and/or production activities ceased. If no sufficient baseline testing in conducted, the owner of a water supply may conclude, rightly or wrongly, that a subsequently observed contamination of his or her water supply was attributed to the drilling or production activity.

According to microseismic testing conducted by some entities after stimulation, longitudinal microcracks produced in Marcellus shale by hydrofracturing have been measured to travel as far as

2400 feet from the horizontal lateral. These microfractures travel along a path of least resistance, and are effectively sealed from the other shale formations above the Marcellus zone by a layer of limestone just above the Marcellus shale. It is easier for the microcracks to travel through the Marcellus shale than to break into the limestone which lies above. While there may be some naturally occurring fractures or fissures in this limestone layer, the limestone effectively acts as a caprock, or a relatively impermeable barrier above the stimulated Marcellus production zone. The hydrostatic pressures are carefully monitored during the hydrofracturing process, and the frack is immediately ceased if a sudden and unanticipated pressure drop is observed during the fracking procedure. Such a sudden pressure drop could indicate that an unanticipated void or cavern was encountered, or the ability to maintain containment within the production zone had been somehow compromised.

Even if some fluids were to theoretically get past the first limestone caprock layer, there is a second layer of limestone caprock several layers above, which would effectively keep any of the escaping fluids trapped in the Devonian shale layers that lay above the Marcellus zone. This second limestone layer would keep any such fluids away from the freshwater supplies.

The most likely route of contamination from Marcellus shale drilling and stimulation activities would likely come from fluids getting into the annulus of the borehole, (or the space between the production pipe and the drilled out rock formations), where the limestone caprock was compromised during he drilling process. This breach of the limestone caprock is effectively repaired and resealed during the casing and cementing process, and keeps fluids from crossing from one zone into another. That is the reason why the establishment of sufficient casing and cementing requirements for the production zone are so important for a horizontal Marcellus well.

The present standards, which provide a 1000 foot presumption and a 1000 foot zone for predrilling baseline testing, may be sufficient for testing the integrity of a vertical well, but it is generally agreed that an expanded level of baseline testing is reasonable to confirm the integrity of a horizontal well.

Since the horizontal laterals are drilled on a gradual slope after the well-bore deviates from vertical, the actual fracking activity is initiated several hundred feet away from the center of the well pad. While the vertical bore would still represent the most likely conduit for a contaminant associated with drilling or stimulation activities from reaching a fresh water zone, the Committee agreed, by amendment, to expand the statutory presumption (and the associated baseline testing driven by the presumption) from 1000 feet of the well to 2500 feet of the center of the well pad.

The amendment also specifically provided that this presumption would be rebutted by the following:

1. The pollution existed prior to the drilling or alteration activity, based upon a predrilling or prealteration survey.
2. The landowner or water purveyor refused to allow the operator access to the property to

conduct a predrilling or prealteration survey.

3. The water supply is not within 2500 feet of the well.

4, The pollution occurred more than 6 months after completion of drilling or alteration activities.

5. The pollution occurred as the result of some cause other than the drilling or alteration activity.

The predrilling or prealteration testing would have to be conducted by an independent certified laboratory, and a copy of the results of the survey would be submitted to the DEP and to the landowner or water purveyor in a manner required by the DEP.

The public notice provided with the permit application shall also advise owners of water supplies and water purveyors in proximity of the proposed drilling activities of the advisability of securing such prealteration and predrilling surveys, and the associated presumptions that are associated with those tests.

The conduct of these baseline studies will provide the drilling industry with its best ability to defend itself from future claims if any water supplies should later be found to be contaminated, after its drilling activities are completed. They will also provide the public with a means to verify when observed contamination is apparently associated with the horizontal drilling and fracking. In the event that repeated contamination is revealed by such baseline testing, the Legislature could revisit the issue, with the benefit of more definitive scientific data.

6. Establishment of additional web-based resources, available to public:

As amended, the bill drafted by the Committee would have the DEP provide resources on its public website which would provide searchable information on Marcellus well applications filed in the state, including county and approximate location, well number, date of application, name of the applicant and well application number. Notice of any scheduled public hearings are to be concurrently published on the DEP website. Finally, an e-notification system is to be established by the DEP, by which individuals, corporations and agencies may register to receive electronic notice of filings and notices pertaining to horizontal well applications, by county of interest.

7. Considerations in reviewing and issuing/conditioning permits:

A. Well location restrictions from residences, water intakes and protection of nearby state waters

One of the most pressing concerns raised by local residents is establishing reasonable distance restrictions from their homes, water intakes and other localized uses that can be adversely impacted by a drilling operation. The Committee adopted an amendment that established several protections for local residents. A general prohibition of drilling within 650 feet of a home or larger agricultural facility, a 100 foot prohibition from drilling from any watercourse or body of water, and 200 feet from a wetland and 300 feet from a naturally occurring trout stream. No wellpad may be

located within 1,000 feet of a public water intake. These prohibitions relating to watercourses may be waived by the DEP upon finding that specialized facilities or practices will assure protection of these waters. The residence/agricultural structures prohibition may be waived by the property owner. The well operator may also request a variance from the DEP if a distance restriction would deprive the owner of the oil and gas the right to produce or share in the oil or gas underlying the surface tract. If a waiver or variances is granted by the DEP, the DEP is to identify the additional measures or practices to be employed at the site.

The well location restriction language is clarified to make it clear that the distance restriction for location near existing springs, wells and other existing water supplies only apply to those water sources that existed at the time the operator first gave notice of entry. This was done to prevent surface owners from sterilizing land from drilling activities by installing wells after notice that a operator was interested in placing a well on their property. This was done to address industry concerns that some surface owners were unfairly taking advantage of this prohibition.

B. Pending amendment on areas of special concern to allow DEP to place special permits conditions

A amendment is currently pending before the committee that will address other localized concerns that may require special limitations places on permitted locations. These include allowing the DEP to consider the drilling activity will potentially threaten a public or private water resources; the well's proximity to municipalities or densely populated areas and the well's impact on those areas; the adequacy of the permit's proposed erosion and sediment control plan and water use plan; the impact on public resources including parks, forests, gamelands and wildlife, natural landmarks, endangered species and historical sites. These protections are intended to facilitate a balance between the gas industry land use and the local communities to protect the local communities from losing exiting natural, historic and other resources that are highly valued and deserving of protection.

8. Impoundment issues.

The DEP is directed to conduct a study and report back to the Legislature next year about the need for further requirements for the regulation of impoundments. The DEP is directed to investigate whether a need for greater regulations to prevent toxins and other hazardous materials contained in impoundments and pits need further air regulation and safety standards and if so to propose those though the rulemaking process. This issue has received much discussion and the committee is asking for an ongoing review be undertaken to satisfy the concerns of the proper management and disposal of the substances generated by these operations.

9. Water use/ water impact issues.

The committee has continued to support the water use and reporting requirements that were developed in the House bill last year and have been incorporated into this draft and were the basis for the Governor's executive order directing the DEP, by emergency rule, to establish these requirements. The committee did adopt on amendment that requires in addition to flow tests for

nearby water wells that water quality tests also be taken to establish baseline water quality for these wells, to determine if the drilling activity has impacted these resources.

10. Casing and cementing standards.

One of the primary issues raised by the public during the public hearings was the concern that the drilling fluids and fracking fluids used to stimulate horizontal Marcellus wells would somehow contaminate well water and other public water supplies. The hydrofracturing or "fracking" process uses large volumes of water under high pressures to fracture and create microcracks in the Marcellus shale so that the large volumes of gas contained in the rock are released under high pressures. Proper containment, recapture and disposal of the drilling fluids and fracking fluids which return to the surface is easily monitored and observed on the surface, as it is collected and contained in tanks, trucks or impoundments. The ability to ensure that the fracking fluids which don't return to the surface are properly contained within the Marcellus production zone, thousands of feet from the surface, is depends on the adequacy of the protective casing and cementing that is done along the length of the well.

The well itself has a number of protections, through the installation of multiple layers of steel and cement, to insure that the gas flows coming from production zones 5000 to 6000 feet below the surface, do not interact with the fresh water supplies located much closer to the surface.

The 7 or more layers of protection begin with a steel surface conductor pipe, which is cemented in place. A new borehole is then drilled through the interior of the conductor pipe to a point below the fresh water zone. At that time, a water protection string of casing is placed in the borehole, and in cemented from the bottom of the hole created below the base of the casing string to the surface. The cementing process causes cement to fill the space between the casing string and the outside diameter of the borehole. A new (smaller) borehole is then drilled down the center of the water protection string to a depth below the last expected coal seam (usually 2000 feet or more). At that point, a coal protection casing string is installed and cemented in place, to the surface. If the coal protection casing cannot be cemented to the surface, WV has certain statutory requirements which are to be satisfied, to insure that all zones are properly sealed off from one another. From that point, a smaller borehole is drilled down the center of the coal protection string, to a point where the well is to deviate from vertical. An intermediate casing is installed, and cemented in place. Finally, the well is drilled to its final depth, and the horizontal drilling extends the borehole along the target formation to the well's final total length.

The fracking activity or stimulation of the well is done along the horizontal length of the production casing, in incremental stages. After one length of the horizontal lateral is stimulated, it is temporarily sealed while the next length of horizontal section is stimulated. After this process is completed, the temporary plugs are removed, and the produced gas starts flowing to the surface at high pressures. The gas which is flowing to the surface through the production pipe is separated from the fresh water zones by at least four layers of steel piping, with at least two of those layers sealed with cement to the surface.

At the time the present WV casing and cementing standards were developed for oil and gas wells, they were developed for vertical wells, and there was no such thing as a horizontal well. While they included clear standards for cementing and completing casing in the water protection zones and the coal protection zones, they did not establish clear or uniform standards for cementing or completing the intermediate string of casing or the production string of casing. The completion techniques in those zones differed depending on the characteristics of the formation being stimulated or produced.

The adequacy of the cementing and packers used to separate fluids introduced into the production zone from the other zones is critical to ensure that the zones above the limestone caprock are not compromised. It is also important to the operator of the well, to insure that the well produces gas efficiently, and the targeted gas supplies are properly contained for production.

While the specific casing and cementing standards for each horizontal well was reviewed and approved by the DEP's Office of Oil and Gas, there is quite frankly a general distrust of the adequacy of those efforts and requirements by some members of the public.

To address that concern, the Committee had its staff review the casing and cementing standards which had been adopted in neighboring states, and compare them to the recently amended standards which have been proposed by a policy letter issued by the Director of the DEP's Office of Oil & Gas. The modified standards proposed by that policy letter are still under comment and review by the Office of Oil & Gas, and may require further revision to address concerns raised by various commentators.

The State of Pennsylvania revisited and amended its casing and cementing standards to reflect what is needed to provide adequate protections for horizontal drilling. The PA casing and cementing standards, which have been in place since October of 2010, were developed by a multidisciplinary effort which included experts from the oil and gas industry, submitted for an extensive public comment period, and have been fully vetted by a completed rulemaking review process. The horizontal formations to be drilled and fracked in West Virginia are essentially the same as those to be drilled and fracked in Pennsylvania. Many of the same operators are drilling horizontal wells in both states and are already well familiar with the Pennsylvania casing and cementing requirements. Therefore, the members of the Committee saw no legitimate reason why the West Virginia casing and cementing standards are not at least as protective as those utilized in Pennsylvania.

The State of Pennsylvania casing and cementing standards are much more detailed and explicit than the current standards or the proposed revisions advanced by the WV Office of Oil & Gas policy letter. The Committee would require that the WV casing and cementing standards be updated to be at least as protective as those that have been implemented for similar formations in Pennsylvania. The adopted Committee amendment requires the Office of Oil & Gas to issue a policy document which incorporates most of those standards as a baseline requirement. The amendment adopted by the Committee reiterates the PA standards, for the most part, with the

exception that the WV protections for the coal protection zones were deemed superior to Pennsylvania's, and were incorporated by reference.

This action would not prevent the WV Office of Oil & Gas from establishing more stringent standards for horizontal wells by rule or by permit condition, or from adopting alternative protections and requirements by rule or permit condition, consistent with best industry practices, as they continue to evolve.

11. Other environmental concerns.

Air Quality

The Committee adopted two amendments to address air quality concerns. If you have toured one of these operations as I have it is striking to see the size of the operation, the number of trucks and diesel engines used in the fracking process, the amount of dust generated, and the size of the large impoundments and pits. All of these have the potential to impact air quality and it is vitally important to investigate whether additional requirements need to be established to regulate these emissions. An amendment was adopted authorizing the Office of Air Quality to regulate these activities and to consider the cumulative impacts of these emissions in determining whether additional air quality permitting is needed. The agency is authorized to promulgate rules as needed to regulate these emissions. The DEP is also directed to conduct a study of health impacts and the need for further legislation for regulation of these activities and to report back to the Legislature on its findings.

12. Application fees and bonding requirements.

A. Permit fees.

This has been a most difficult issue to nail down for the committee. Permit fees are intended to fund the necessary inspectors and permit writers to adequately serve the existing permitting and new permitting activities. Our efforts to find a fair and appropriate permit fee as been thwarted by the inability of the DEP to provide us with a good estimate of the numbers of employees it needs to hire to do its job. We finally did get an estimate of the numbers of employees they will need to do their job regulating the gas industry. It has been extremely frustrating to have the regulatory institution for this state being unable or unwilling to provide a good faith estimate on their funding needs. Nonetheless we reached a number which the DEP says will allow it to hire 9 more inspectors and permit writers. We do not know for sure if this is sufficient to address regulating the thousands of existing wells in the state and properly permitting and inspecting these new wells. We settled on $10,000 for first well and $5,000 for each additional well on a well pad as the permit fee that will fulfill the agency's employment needs.

B. Increased bonding.

Current bonding requirements provide a $5,000 bond with a blanket bond of $50,000 for ten or more wells. The committee agreed to adopt a $50,000 per well bond with a $250,000 blanket bond for these operations. This is close to the information the Committee received that the actual cost is near $50,000 to $60,000 to plug one of these wells.

13. Reports to the Division of Labor

This is a contiguous issue to which the industry has expressed strong opposition. The Committee feels that it is in the best interests of this citizens of this state that we try to track employment in this transitory industry to see what we can do to maximize the number of citizens in this state employed in this industry. The amendment is not onerous to the industry and asked them simply to report to the Division of Labor their in-state and out-of-state employment trends, payroll information and job types held by in-state verses out-of-state, and the number of instate residents employed by them. This would be reported to the Division of Labor which would then generate a report to the Legislature. The hope is that we can develop training and employment opportunities for our citizens in the industry and an important component of that is to being able to track employment trends and opportunities. This is an important component of that effort. The industry feels like they are being singled out by this amendment and they are to the extent it is. But, by its nature the gas industry more than any other has temporary jobs moving throughout our state and we want to be able to monitor those movements to help facilitate better understanding of the employment opportunities for our citizens.

E. Amendments pending for November interim meetings.

Amendment- Establishing requirments for surface owners land use agreement. This proposal is to incentivise gas operators to reach agreement with surface owners prior to entering into the land to conduct drilling operations. The amendment would require the gas operator to pay all legal fees of the surface owner if the surface owner is awarded in court an amount greater than 15% of the last offer made by theoperator.

Amendment- Providing evaluation of area for karst formations and special testing requirements when karst formation found within area drilling is to occur. The purpose of this amendment is to provide additional protections through proper evaluation of the geologic formations in the area to assure no fracking water reached karst formations containing groundwater.

Amendment - Establishing minimum qualifications for Oil and gas inspectors. This amendment will establish minimum experience qualifications for inspectors .

Amendment- Establishing additional localized factors the DEP is to consider when granting a permit: Include dense population areas, location of public water intakes, to allow protection of preexisting conditions to allow the DEP to provide additional protections for these existing conditions.

III. Industry participation.

The House members of this Committee have spoken in one voice about the need for reasoned protections for the citizens of this state impacted by these drilling operations. I have been extremely frustrated by the industry's lack of participation in the process we have undertaken. Despite frequent invitations, they have been unwilling to negotiate and agree to solutions for our most difficult issues. The industry trade groups provided at my invitation, letters responding to proposed amendments under consideration by the Committee. The industry states that it wants fair and reasonable regulations but beside offering criticisms about proposed and adopted amendments, they have not brought forth one proposal offering solutions to the problems we are trying to address.

IV. Conclusion.

I am hopeful that legislation can be enacted in West Virginia to address the concerns of all those benefitting and impacted by the new horizontal drilling activities. I encourage the United State Congress to also investigate whether any uniform regulatory requirements are appropriate for the various states regarding this new gas drilling activity. I do believe that the industry can profitably operate in this state without causing harm to the local communities and residences, but a balance must be struck between these competing interests. I stand ready to offer you any assistance that I can provide in this important inquiry and will continue in my efforts to advance a reasonable and balanced approach to regulation of this new opportunity for West Virginia.