COMMONWEALTH OF PENNSYLVANIA

HOUSE OF REPRESENTATIVES

ENVIRONMENTAL RESOURCES AND ENERGY COMMITTEE

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PUBLIC HEARING IN RE: BILL HB 2213 PN3106

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BEFORE: CAMILLE BUD GEORGE, Chairman
SCOTT E. HUTCHINSON, Chairman
Bryan Barbin, Michael Carroll, Matthew Gabler, Members

HEARING: Thursday, February 18, 2010
Commencing at 12:58 p.m.

LOCATION: Knights of Columbus
512 Arnold Avenue
Clearfield, PA 16830

WITNESSES: John T. Hines, Dana K. Aunkst, John K. Baillie, Thomas Beauduy, Kathryn Klaber, David Spigelmyer, Scott Perry

Reporter: Jackie L. Hazlett

I N D E X

P R O C E E D I N G S

CHAIRMAN GEORGE:

If you will, we'll commence with the hearing that has been called by the Environmental Committee. And the matter we will discuss today is water preservation and protection, in that we anticipate a great deal of activity in certain parts of Pennsylvania that will come about from the drilling of Marcellus Shale.

I'd like to ask my members --- and I apologize. There are certain areas of this state where it snowed two or three inches last night, and they apparently anticipated that the roads would be bad. But I want to congratulate all concerned as the roads were pretty bare, so they did a commendable job. I'll start on my right and have the individuals introduce themselves.

MR. CARROLL:

My name is Mike Carroll. I represent parts of Luzerne and Monroe Counties in northeastern Pennsylvania.

MR. BARBIN:

Okay. Bryan Barbin. I represent Cambria County. I'm from Johnstown.

CHAIRMAN HUTCHINSON:

Representative Scott Hutchinson from Venango County. I live in Oil City. It's a pleasure to be here and I think it's a very important topic we have today.

MR. GABLER:

Matt Gabler from across the mountain over in DuBois. I represent the northwest corner of Clearfield County and all of Elk County.

CHAIRMAN GEORGE:

I thank the gentlemen for their attendance. The purpose of this hearing is to solicit testimony on mitigating environmental risks associated with drilling in the Marcellus Shale formation in general and House Bill 2213 in particular. You will find on the back table a copy of this legislation, along with a bill analysis and comment on House Bill 2213 prepared by our staff.

While Pennsylvania's no stranger to gas exploration, the Marcellus Shale deposits present new challenges to our current system of drilling. The size and magnitude of the well drilling poses new challenges. They must be examined and understood to ensure that the industry, as well as the environment, are protected.

To better understand the mechanisms involved in the drilling process along with the potential environmental concerns posed by this new water-intensive drilling, we have invited various individuals here today to testify before the Environmental Resources and Energy Committee. By becoming educated about the Marcellus Shale and the fracing used to extract this valuable resource, I believe legislation will come to understand those areas where we will best be able to serve the people of this fine Commonwealth. I turn to my colleague Chairman Hutchinson.

CHAIRMAN HUTCHINSON:

Thank you, Mr. Chairman. It is a pleasure to be here today. I do come from Oil City, Pennsylvania, but --- and there is a long history of oil and gas drilling in Pennsylvania, and I think it is important that we do it right. My area of the state, I'm told, will not have Marcellus Shale drilling per se, in the near future anyways. It is not --- it's technically within the Marcellus area but not a more lucrative area to drill.

But be that as it may, I think we in Pennsylvania have to make sure that what laws are on the books are adequate to deal with any environmental

problems that may occur in drilling. But it's also very important that we take advantage of this wonderful natural resource to help build the economy in Pennsylvania.

And so I think there is a balance that can be struck there and I look forward to learning more at today's hearing, and I thank the Chairman for inviting us to Clearfield County, which I'll have you know, Clearfield County is where both of my parents were born and raised so it's good to be back in the old homestead area. Thank you, Mr. Chairman.

CHAIRMAN GEORGE:

I thank you. We have a full --- we have a full agenda this afternoon, and consequently it is imperative that those presenting their testimony keep their presentations within the allotted time. Your complete testimony should be submitted for the record. And without further ado, testifying first is John Hines, Deputy Secretary of Water Management for the Pennsylvania Department of Environmental Resources. Welcome, Mr. Hines.

MR. HINES:

Thank you, sir. Thank you, Chairman George, Chairman Hutchinson.

CHAIRMAN GEORGE:

You can introduce your colleagues, if you will.

MR. HINES:

I will do so. With me today to my right is our Bureau --- our Director of our Bureau of Oil Gas Management, Scott Perry. And to my left is our Director of Water Standards and Facilities Regulations, Dana Aunkst. I do want to thank you for this opportunity for the Department to provide input at this hearing. This issue has basically taken much of the Department's time as we focus on the Marcellus Shale.

I want to start out with a quote, and it is, children who are born into a culture rich with water learn to live with it, but often times we don't respect it. And if you look at Pennsylvania across the board, we are blessed with 86,000 miles of streams, 4,000 lakes, an estimated 83,000,000,000 gallons of groundwater. We have a toehold on the Great Lakes system, which connects us to 20 percent of the world's fresh surface water. We're truly blessed. We live with it, but living with it, sometimes we do not respect it.

With every --- with the ever-increasing energy demands that have taken place in this country,

we are at a crossroads. We're at a crossroads of decision-making in the Commonwealth of Pennsylvania. How will we deal with energy development while protecting our water resources?

National Geographic estimates that by 2025 2.7 billion people on the face of the planet will not have access to water, period. The decision we make today will have an impact on tomorrow. I'll put it simply, gentlemen. Our job is to produce the gas and protect the water for our future. Can everybody hear me okay? I think we're all right now.

UNIDENTIFIED:

No.

MR. HINES:

I don't know if I'll be able to repeat that. Yeah, I might have to hold that --- is this better? Here we go.

CHAIRMAN GEORGE:

We'll try that again.

MR. HINES:

Well, I won't go --- I think everybody up front heard me and I won't go back to that portion of my remarks. Can everyone hear me now?

UNIDENTIFIED:

Yes.

MR. HINES:

As I was saying, gentlemen, we are at a crossroads in Pennsylvania, protecting our water resources while producing the gas that comes about in its play, and the decisions we have to make play a huge part in it. Extracting natural gas from the Marcellus Shale formation requires horizontal drilling and a process known as hydraulic fracturing.

This process uses greater amounts of water than traditional oil and gas drilling. Drilling for natural gas from the shale requires pumping large amounts of water, sometimes in the magnitude of a few million gallons, along with sand and other chemicals into the formation, fracturing the shale around the well and allowing the gas to flow freely.

When pressure --- or when the pressure is released, some water will flow back to the surface. In addition, once the hydraulic fracturing process is complete, the used water must be treated or disposed of. And that is one of the biggest issues we at the Department face now is the treatment of frac water and how we move forward.

Part of our discussion today is related to the management of wastewater. The Department utilizes a number of acts to do so. First is the Oil

and Gas Act, second is the Pennsylvania Clean Streams Law, third is the Dam Safety and Encroachments Act, and fourth is the Solid Waste Management Act, as well as a federal requirement that we hold primacy the federal Clean Water Act. This creates an umbrella for us in managing that play overall.

And by statute, since water generated by these wells is considered as a residual waste, it must be contained, one, in impermeable tanks or impoundments, and two, be treated or disposed of at a permanent facility that's approved to receive waste water. The solid, the solid waste that is produced, processed and disposed at the well site is regulated under the Oil and Gas Act and the oil/gas regulations.

Once these wastes are removed from the site, well site, they are governed by Pennsylvania solid waste and the residual waste regulations. As such they are required to be transported, stored, transferred, processed, treated and disposed in accordance with 25 Pennsylvania Code, Chapters 20, 287 to 299.

Our challenge stems from determining the cost-effective means to treat and dispose of the water safely and effectively. The Department has spent an inordinate amount of time of tying our existing

programs together so we can manage this play seamlessly and effectively.

Despite our best efforts to educate the public and the media, rumors persist that the chemicals used in the fracing process are secret and that DEP has no knowledge of what chemicals are used. On the contrary, the Department has material safety data sheets from the industry that disclose all chemicals used by the various fracing companies. These sheets are also made available to local emergency responders and are of public record.

DEP has posted a list of basic chemicals used in the fracturing process on its website and many of the companies operating in the Marcellus Shale have posted similar company-specific information on their collective websites. I should note, however, that while DEP does know what chemicals are in the frac fluid, we do not know the exact proportion of the chemicals used as the industry considers this information to be a trade secret.

The treatment and disposal of wastewater proposes a challenge to the Department and the oil and gas industry. From a water quality perspective, our key issues to deal with are total dissolved solids, T.D.S.

T.D.S. is a measure of all elements dissolved in water and can include carbonates, chlorides, sulfates, nitrates, sodium, potassium, calcium and magnesium. Sources of T.D.S. include sewage treatment plants --- or sources that T.D.S. can come from include sewage treatment plants, storm water runoff, meat packing, vegetable processing, bakeries, beverage processing facilities, leather processing, electric services and acid mine and abandoned mine drainage.

As you can see, when we deal with T.D.S. issues we're not only dealing with the oil gas industry but just about any discharge that we have throughout the Commonwealth. In fact, many of the areas where the drilling for natural gas is proposed have a history of mining activities and are affected by A.M.D. That history has left the Commonwealth with a difficult pollution legacy. Considering the already elevated levels of dissolved solids in some areas of the state, stringent control of dissolved solids will likely be necessary for us to further protect water quality.

The problem of T.D.S. is a very real issue in Pennsylvania waterways. In the years 2008 and 2009, T.D.S. levels exceeded drinking water

standards along the Monongahela River. This serves as a reminder and a warning that rivers and waterways can only dilute so much pollution before the water quality reaches unacceptable levels. In addition, Pennsylvania water treatment plants are not equipped to remove T.D.S. from drinking water and these pollutants are delivered through pipes and out of the taps of our residents.

Last April the Department took action and issued a Permitting Strategy for High T.D.S. Wastewater Discharges. This strategy presents an approach that allows the Department, until proposed regulations are final, to effectively deal with the increasing demand for assimilative capacity in our waterways.

As a major part of this strategy the Department has proposed Chapter 95 Wastewater Treatment requirements, new requirements in our Chapter 95 regulations. To date the Department has held four public meetings regarding this proposed regulation revision and has received numerous, numerous comments. Close to 2000 commenters (phonetic) at this point in time have provided comment, some encouraging the Department with the adoption of this regulation, others coming up with

ideas on how we can further this draft and look at other options.

The Department has heard from various presenters from the environmental stakeholder groups that could be impacted by the change in this regulation, including the oil and gas industry. Prior to these draft changes being made, our own Water Resources Advisory Committee noted concerns over the technologies available for treatment of high T.D.S. wastewater, as well as the costs associated with that treatment.

As such, this Water Resource Advisory Committee requested that the Department work with a subcommittee to specifically address these concerns. This was agreed and directed by the Environmental Quality Board for us to sit down with a variety or a subcommittee of our Water Resource Advisory Committee made up of a variety of stakeholders who would work with us on two key issues, technologies available and economic burden to our industries across the state in dealing with treatment.

We have been working with them since August. We've had a number of ideas fleshed out, and we will continue to do so throughout the public comment period and as we move forward to a final

regulation.

The subcommittee has further examined the technologies available and costs associated with treatment of T.D.S. and has determined that technologies exist to remove pollutants so that the resulting effluent can be discharged in streams. However, the capacity to treat the expected levels of wastewater is not yet available. Numerous permit applications for these types of facilities have been submitted to the Department and are currently being reviewed.

Other disposal for wastewater are available such as underground injection or passive evaporation basins. Underground injection is not currently available in Pennsylvania at the capacity necessary to handle the amount of wastewater that is generated so much of this type of disposal is taking place in other states. In addition, the costs associated with the transportation of wastewater also limits the use of underground injection.

Pennsylvania’s climate does not lend itself readily to the use of large evaporation basins, which are frequently used in more arid sections of the country. The most likely treatment technology, evaporation and distillation, is an energy-intensive

activity and has been viewed by the industry as cost-prohibitive.

The initial cost estimate provided by the Department for the treatment of the --- are approximately 25 cents a gallon. Industry estimates suggest that those costs could be estimated between 12 cents and 25 cents per gallon, so the technology purveyors that have been in the Department have estimated the cost for treatment to be between ten cents and twenty cents per gallon.

The Department is encouraging the reuse and recycling of wastewater. This will cut down on water withdrawals and dramatically reduce the amount of water being taken at --- taken to treatment plants. The Department has heard reports that up to 50 percent of operators are reusing at least a portion of the wastewater. Some operators have reported nearly 100 percent reuse.

Regardless, even with reuse and recycling, we still must find a solution for the flow-back and production fluids that cannot be reused. As drilling activities continue to increase in Pennsylvania, the Department fully anticipates the need for increased treatment capacity, even at the reduced flow-back estimates.

The Department realizes and acknowledges that while no energy source is perfect, that natural gas is one of the best clean fuel options we have available to us today. Some communities have experienced small fish kills from minor spills, complications from erosion and sediment control violations and during drilling operations and like those in Dimock, Susquehanna County and along Hedgehog Lane in Bradford Township, where methane was detected in the drinking wells of residents as a result of gas migration.

When these problems occur, the Department quickly responds by requiring cleanup, as well as imposing fines, revoking permits or ordering drilling operations to cease. In addition the Department closely monitors operations at well sites through routine inspections.

And I must note that in some of the erosion and sedimentation violations, the Department took the first step, not only to issue the notice of violation to the company, but also to the engineer who designed the plans for that particular site. That's definitely one of the first steps we've taken in that direction.

In addition to protecting our surface

waters, the Department is working to improve our well construction standards to protect the public from gas migration events. Both DEP and the oil and gas industry recognize that gas migration is not acceptable. A properly cased and cemented well is critical to containing gas, oil and other fluids within the well bore.

The draft regulations make important improvements through such measures as pressure testing casing used in Marcellus Shell and other high pressure wells, and further defining the specifications for oilfield grade cement to be used for the well casing. Draft regulations will also require operators to inspect all existing wells quarterly to insure that each well is structurally sound and report the results of each inspection to the DEP.

As mentioned, these draft regulations were developed with the valuable assistance of our Oil and Gas Technical Advisory Board. At the Board's January 21st, 2010 meeting, members voted unanimously to recommend the Department move forward in finalizing these regulations.

The regulations and protections I've described above are all-important to the protection of our natural resources. However, gentleman, it means

very little if the Department does not have the sufficient staff necessary to inspect well sites and oversee the environmentally protective development of this resource.

Through the increased well permit fees, the Department was able to add an additional 37 people to its regional permitting, compliance and enforcement staff in 2009. While this additional complement has been able to oversee the current level of development, they will not be able to do the job if the Marcellus well drilling activity triples in 2010, as has been estimated.

In addition, the governor directed the Department to hire an additional 68 Oil and Gas Compliance and Enforcement staff in response to this continued dramatic growth. These positions will be 100 percent funded from money generated with new higher permitting fees instituted in 2009 that are based on well length and type. The new permit fees, which have not been increased since 1984, were enacted with the support of the environmental community and organizations representing the oil and gas industry including the Marcellus Shale Committee, the Pennsylvania Oil and Gas Association and the Independent Oil and Gas Association of Pennsylvania.

Gentlemen, in closing, DEP is working each day to ensure that natural gas is produced responsibly and our water resources are protected. We'll continue to work with our legislature, our other agencies, environmental workers, agents of the oil and gas industry to develop these resources responsibly.

Chairman George, Chairman Hutchinson, members of the Committee, I thank you for your attention. I look forward to your thoughts and questions. Thank you.

CHAIRMAN GEORGE:

I thank you for your testimony. I assume you'll stand for questioning?

MR. HINES:

Yes, sir.

CHAIRMAN GEORGE:

I'll start with my right. Representative Carroll, do you have any questions?

MR. CARROLL:

Thank you, Mr. Chairman. I'll try to speak loudly so folks can hear. You mentioned that in some other states there is underground injection devices. Where are those other states?

MR. HINES:

Underground injection occurring? I

believe right now the way the underground injection program is run, it is actually monitored by E.P.A. in Pennsylvania. West Virginia, the sistering (phonetic) state, West Virginia has underground injection, as does Ohio. I'm not certain if New York does, and ---.

MR. CARROLL:

And could you tell me, generally speaking, the wastewater treatment facilities we have in our state, how many of those are capable of handling and treating frac water properly?

MR. HINES:

I'm going to defer to my colleague, Dana.

MR. AUNKST:

Currently we probably have --- and again, this dynamic changes weekly. I would estimate currently about 17 or 18 facilities that are approved to accept and treat this type of wastewater. They are almost all located in the northwestern part of Pennsylvania and southwestern part of Pennsylvania, because historically that's where the industry has been.

MR. CARROLL:

What steps will have to be taken in order for those kinds of facilities to be approved in the northeast part of the state?

MR. AUNKST:

Currently we do have --- currently we have permit applications in-house in both north central and northeastern regional offices for new facilities. There are 16 in the north central office, I believe, three in the northeast office.

These will be brand new facilities that would have to be built to treat this type of wastewater. The treatment essentially consists of removing metals, adjusting P.H. and addressing the total dissolved solids through some type of technology, and right now it looks predominantly like that's going to be distillation.

MR. CARROLL:

Okay. Finally, just a comment. We really do have to get this right. You know, the folks that I represent are the descendents of the folks who worked in the anthracite coal industry. And we have a, you know, a noteworthy legacy when it comes to anthracite coal mining in northeastern Pennsylvania.

You know, we can't have any kind of a repeat of any of those errors that were made. And so it really does fall on the Department's shoulders to get this right as the regulatory agency. And I have great faith that we've come a long way, both on the

industry side and on the governmental side with respect to how we're going to move forward. But we really do have to get this right, because at the end of the day, you know, the water is an unbelievably valuable resource for all sorts of reasons.

And so I implore the Department, and I'll do the same thing with the industry, as well, that we have to partner, because we can't have a tug of war here where the Department tries to regulate and the industry is trying to avoid. We have to be partners in this effort, and I think we can get there if we're smart about it and if we have an open mind about it. It's crucially important for the folks who have a reliance on water and for people who have a reliance on making sure that they can live in their homes in a safe and appropriate way.

So thank you very much for your appearance here today. This is a vitally important subject to the folks I represent, and I appreciate Chairman George having a hearing.

MR. HINES:

Thank you, sir.

CHAIRMAN GEORGE:

Representative Barbin?

MR. BARBIN:

Thank you, Mr. Chairman. My questions relate to --- is it true that when you're trying to come up with these regulations and you're trying to reduce the overall total dissolved solids that you have to deal with two issues, both salts as well as metals; is that a true statement?

MR. AUNKST:

Yes.

MR. BARBIN:

Is it also true that the --- that when you're trying to make the total dissolved solids number, you have to look at the existing stream and what their salts or their metal --- is that currently how it's done? Do you look at both of those factors?

MR. AUNKST:

Yes.

MR. BARBIN:

So when we're doing this regulation, is it necessary for regulations to have --- not only look at getting rid of the heavy metals, but also the salt in relationship to what that particular existing stream has already? Is that fair?

MR. AUNKST:

That's correct, that's correct.

MR. BARBIN:

Okay. So when we do a regulation, we have to make sure that our regulation is not only specific to what the wastewater is, but also to the stream, because we've all read about what's happened in the Monongahala. And what were hearing is, is that that stream is already at a level that exceeds the safe drinking water standards before any wastewater or brine would come into that waterway. So is your regulation going to address that issue, as well as this total number?

MR. AUNKST:

Yes.

MR. BARBIN:

And I guess how, how does it do that?

MR. AUNKST:

Actually regulations in place now are water quality standards in place to protect the streams themselves, specifically, site specifically, such that they meet the designated uses which are for the protection of fish and aquatic life, the protection of drinking water sources, and the protection of industrial waste sources for recreation, those types of uses. And the standards have been developed in stream. Actual merit criteria values have been developed in streams in Pennsylvania, and

they must be met and maintained. And that's how we protect the individual streams.

The other side of that issue is an effluent standard, a treatment requirement that a minimum level of treatment needs to be provided by all facilities of this category to level the playing field and distribute the economic burden fairly and equitably. That's called a technology-based standard.

So the combination of the technology-based standard for all industries and then if there's a need to make the effluent limits more stringent to meet the criteria specific to that stream, those numbers are then implemented through our permitting process as effluent numbers. So you get the more stringent of the stream-based limits or the technology-based limits as your effluent. So yes, it's a two-tiered level of protection.

MR. BARBIN:

And Mr. Chairman, thank you for allowing me to ask these questions. I look forward to working with DEP.

CHAIRMAN GEORGE:

Representative Hutchinson.

CHAIRMAN HUTCHINSON:

Thank you. I guess I want to go on to

two, two subject areas. Number one, I just want to --- and while we have you here, I think one of our other testifiers is also going to make mention of this, but I want to clear the record about --- is it Dimock Township? Is that the correct ---?

MR. HINES:

Yeah.

CHAIRMAN HUTCINSON:

Yeah. And although you mentioned that as a problem --- sort of kind of you said it was a problem in your testimony --- it's my understanding, and I think part of this understanding comes from a release from your Department, that Dimock Township is not impacted by Marcellus drilling; is that correct?

MR. PERRY:

The water supply problems in Dimock were a result of Marcellus well, wet wells located adjacent to those homes. We had about ten Marcellus wells that were in close proximity to about 13 drinking water wells, and those wells were impacted by those Marcellus wells.

CHAIRMAN HUTCHINSON:

My understanding is that that was from --- those were from shallower, non-Marcellus. That's where I want to go with this.

MR. PERRY:

I'm sorry. I misunderstood your question.

CHAIRMAN HUTCHINSON:

Okay.

MR. PERRY:

There was a Marcellus Well being drilled, but you're absolutely correct. The gas that impacted those water wells came from a shallower formation that they encountered on the way down. It was not properly isolated while they were drilling. So it was not gas coming from the Marcellus Shale formation itself, it was a shallower formation.

CHAIRMAN HUTCHINSON:

And as a follow-up to that, it's also, just for the record, the hydrofracturing activity is not --- has not impacted the water supplies there? Is that a true statement?

MR. PERRY:

To the best of our knowledge, we have never seen direct communication from a frac job into fresh groundwater. Fracing's been the standard practice in Pennsylvania since maybe the late '50s, and right now about 100, almost 100 percent of all wells, oil and gas, undergo the hydrofracture process

using the same chemicals that they use in Marcellus. We've not seen, we've not seen fresh water being impacted directly by fracing.

CHAIRMAN HUTCHINSON:

Thank you very much for clarifying that. Because that --- both of those statements clarify what I know to be true, and unfortunately many have used these examples as ways that somehow Marcellus Shale and fracing is ruining the environment. And although there is potential there, I will admit that, it has been done very safely. The fracturing's been done very safely for many, many years in Pennsylvania and across the country, so ---.

The other line of questioning I wanted to ask, I wanted to --- where'd that go? Okay. Regarding the proposed T.D.S. rates, I wanted to see if it's possible, and it's my understanding that you are working with a technical committee to make sure that you do this the right way. Is that in any way --- have you slowed down the regulatory approval process in any way to accommodate that, or are you going to just go ahead, do the regulations and then, then say, well, we're getting technical assistance from industry sort of after the fact, I guess?

MR HINES:

The answer, the short answer is no. The way the process is set up is the Environmental Quality Board directed us to work with a subcommittee of our Water Resources Advisory Committee. They had two key issues they had to contend with, the questions of how are we going to deal with T.D.S. from an economic and a technology standpoint? In addition, the subcommittee will work with us as we evaluate the various public comments.

So the answer is that the subcommittee is actually part of the regulatory development process. They were to provide us a letter for our Water Resource Advisory Committee, make a recommendation, one of which, I understand, is dealing with reuse and recycling. The other one is dealing with primarily a watershed approach to managing T.D.S. issues.

My understanding, although I wasn't at that particular meeting --- Dana was, I believe --- the Committee did not get full concurrence on that. But we will be getting those types of comments through this process through our own Water Resource Advisory Committee.

CHAIRMAN HUTCHINSON:

I just want to emphasis how important it is that you work with not only the oil and gas

industry, but there's so many --- you listed all the other industries that are impacted by T.D.S. regulations. And it could have a huge, huge impact on everything from water, you know, sewage rates to other industries that may lose employment because they can't comply with these things.

So I ask you to do this in a thoughtful, comprehensive and technical way as you move forward. This is a big change you're proposing, and I thank you for taking those thoughts into consideration. Thank you.

CHAIRMAN GEORGE:

Representative Gabler?

MR. GABLER:

Thank you, Mr. Chairman. I just had a quick question to hopefully frame the issue a little bit better. As I'm thinking through this, we're talking about all the different ways in which water may be impacted through Marcellus Shale activity. And I'm thinking through the different processes in which a Marcellus Shale well comes about. And from my own knowledge, it seems to me that there's four areas that you may want to look at where water impacts my occur. This is my own thoughts here.

In the initial drilling, the well goes

down through the water table and measures need to be taken to make sure that that's done safely. Once you're down through there's concrete casing, and to ensure the integrity of that casing, to make sure there is no back and forth between the water table and the well. Then once you got the fracturing, the hydrofracturing going on, you've got flow-back and disposal to deal with.

And then also you mentioned in your testimony that there is the question of gas migration into other wells. Are there any other areas involved in a drilling operation where you think that it's important to look at for water purposes?

MR. HINES:

Well, let me, let me walk you through. And when you said four points, and it's really --- the way I describe it is a four-step process. From beginning to end, just like from cradle to grave, if you will, on the water end, step one is the water withdrawal aspect of it.

And the Department manages water withdrawal through our Clean Streams Law and a little act called Act 220 2002, which was the Water Resources Planning Act. Act 220 requires any withdrawals over 10,000 gallons a day on a 30-day average to be

registered by the State.

MR. GABLER:

Uh-huh (yes).

MR. HINES:

Combining that with the Clean Streams Law is how we are managing the withdrawal aspect of it. So every company has to produce a water management plan. Basically, where are you going to withdraw all the water from for your fracturing process? Then you have to do an evaluation on the impacts to the stream or that water body of that withdrawal. So that's step one.

Step two really deals with the site operations. And although Scott is probably more articulate on that point, I'll just kind of give it globally. There's two key areas, our erosion and sedimentation regulations, basically how we manage the site development, keeping the mud out of the stream as you develop the site. Then there's the actual Oil and Gas Act, which deals with the drilling aspect of it, the site design and other components of the site.

The next piece of that is the transportation of the frac water, which is managed under our Solid Waste Management Act. And then finally it is the disposal process, which we are

managing under the Solid Waste Management Act, the Clean Streams Law and our N.P.D.E.S. permitting.

So and it really took time for the Department, we looked at our existing regulations, our laws in the books, how can we stitch together a program from the withdrawal to the disposal that both serves with some clarity --- and although arguably clarity and regulations is an oxymoron --- but it serves clarity for the industry, but most importantly it protects that water from the time of the withdrawal to the time when it's disposed of.

MR. GABLER:

Thank you very much. I wanted to go a little bit further, actually as Representative Hutchinson did a little bit ago, and me too, I wanted to understand the aspects of gas migration a bit more. I've had some discussions with constituents and would really like to extend my understanding on this. So based on that exchange, it's my understanding that there has not been to anyone's knowledge an instance where gas from the Marcellus formation has found its way through the ground upward into the water table?

MR. HINES:

That's correct; not to our knowledge.

MR. GABLER:

So how does gas migration happen? It would be through, it would be through the process of when you're drilling down, you hit a more shallow formation that you were expecting?

MR. PERRY:

That's what happened at Dimock. And the other ways that it happens is basically through improper casing and cementing, the points that you raised. If you do not take care to have enough cement in place and it's not properly cemented, you're going to have an opportunity for gas to escape the well bore. And that's what happened in the Hedgehog Lane incident that John Hines mentioned, in addition to Dimock.

MR. GABLER:

I've had a constituent raise some concerns to me that concrete by nature is a porous material. So how does a porous material --- what kind of standards are in place for the concrete to make sure that the casing does not allow any exchange into and out of the well?

MR. PERRY:

Well, right now we have basically a narrative standard that's supposed to prevent that from happening. We are amending the regulations as we

speak to pull in A.S.T.F. cementing standards so that you have more specific regulations over the cement.

So cement, while it does have some porosity, has been obviously successful in preventing gas migration in the overwhelming number of wells that have been drilled in Pennsylvania. We have almost 120,000 active wells in Pennsylvania right now, and only 1,000 of which are Marcellus. So we have a long history of preventing gas from escaping these wells, and the cement and casing practices are key to that.

MR. GABLER:

How common is it for a cement casing to fail?

MR. PERRY:

It's uncommon. Again, it's the vast minority of cases where you have a problem in the first place. If you drill 5,000 wells in a year, we don't expect to see more than one or two or ten water supply complaints, and maybe one of which would be gas migration. It's been unfortunate, though, that we've had the Hedgehog Lane and Dimock situation occur in the same year.

MR. GABLER:

Now, what would be the most common reason for a cement casing to fail? In your experience, what

would cause that to happen? Was it not constructed properly or was it beyond prediction?

MR. PERRY:

For casing, if you're using new casing, the issue would be the coupling. If you're using --- you have plain welded pipe, so a bad weld job can leave a pinprick hole in the casing.

And then also when you've got collar casing where you're screwing the two pipes into place, if that joint isn't tight enough you could have a problem there. But the casing failure is I think less than the cementing problem. The cement plays a more crucial role because you're going to have the cement going up on the outside of the casing as it'll fill in any holes or defects that might be there in the casing.

MR. GABLER:

Very good. Thank you. This has certainly helped extend my understanding, and I look forward to further testimony. Thank you very much.

CHAIRMAN GEORGE:

I thank the gentlemen. It's getting late and I have other testifiers here, so I'm just going to ask you a couple of quick questions very pointedly. I'm amazed that I read and heard in your testimony

that the material that is used in fracing is a trade secret. My question to you is that how in the world do you know when it's treated in a plant that it's treated properly? If you don't know what it was before it started, how in the world do you know what it is when it's finished?

MR. AUNKST:

Well, as Mr. Hines said in his testimony, we know what the parameters are, we know the chemicals.

CHAIRMAN GEORGE:

You don't know whether what is toxic is being taking out. And the second question I want to give you now is that there's as much as 17 percent of that material stays in the ground; is that accurate?

MR. PERRY:

The initial flow-back from a Marcellus well is about a third of the water that's put down it. Over time the rest of it comes back out as produced wastewater. That wastewater has to be completely chemically characterized before it can be taken for disposal. That's part of our residual waste regulations, and that information's supposed to be made available to the wastewater treatment plants, as well.

CHAIRMAN GEORGE:

So you wouldn't have any objections, either of you, if in legislation we insisted that we know --- and it's amazing to me that with all these companies, every one of them have only their own trade secret. I just don't agree with that. And I also what I've read is that there's certain toxic chemicals in that water and that some of it can be carcinogen carrying; isn't that true?

MR. AUNKST:

One or two of the parameters that we've seen are known carcinogens, that's true. But again, as a properly characterized waste, when water comes back out of the well, in cases that we've looked at where we've looked at all of these parameters, they're non-detectable except for half a dozen. And those do get treated through the treatment process.

CHAIRMAN GEORGE:

Now, while you're there, the use of an open pit to store wastewater is meant to be temporary, but drilling a horizontal well could take weeks. Isn't it unsafe to allow the use of open pits for weeks on time when the pit liner can easily be breached?

MR. HINES:

Mr. George, we have very stringent construction standards for pits and impoundments. We evaluate that in the construction process. We do groundwater monitoring at those sites and we utilize a 30-millimeter liner on any of those pits. We do feel we have very stringent construction standards on those.

CHAIRMAN GEORGE:

Now, does the DEP have a C.A.S. number for every chemical constituent in the solution?

MR. HINES:

I believe we have a C.S. number for the majority of those constituents. We will be working to get all those constituents identified.

MR. PERRY:

We have access, we have access to both the --- all of the C.A.S. numbers through E.P.A. The material safety data sheets we have in hand do have a handful of chemicals that do not provide the numeric identifier and --- but we can work with E.P.A. to get that, that identifier.

CHAIRMAN GEORGE:

I thank you all for your testimony. Thank you very much.

MR. HINES:

Thank you, Representative George. Have a good day.

CHAIRMAN GEORGE:

Now we call on the next testifier. Gentleman, Thomas W. Beauduy, Deputy Director and Counsel for the Susquehanna River Basin Commission. Welcome.

MR. BEAUDUY:

Thank you, Mr. Chairman. Is this working?

CHAIRMAN HUTCHINSON:

Yes.

MR. BEAUDUY:

Chairman Hutchinson, members of the Committee, we appreciate the opportunity to be here today. As you know, we are a federal-interstate compact commission and we have the responsibility and authority to manage water resources throughout the Susquehanna River Basin.

The Chairman's letter of invitation today to speak here today asked us to comment not only on mitigating environmental risks associated with drilling in the Marcellus Shale in general, but the provisions of House Bill Number 2213 in particular. With respect to 2213, let me commend you as the

Committee generally, and all cosponsors for your interest in proposing or considering improvements to the Oil and Gas Act of 1984.

At the time that legislation was crafted --- and there's a number of us in the room that actually have fingerprints on that legislation. I'm dating myself, but not as a member but as a staffer. I think it's very fair to say that the activity we are experiencing today in the Marcellus Shale play was never contemplated when that Act was put together. And so therefore it's appropriate to take a look at that law, the governing statute and make sure that it meets contemporary standards. So I compliment you on that initiative.

It is always appropriate as circumstances change to look at statutes that were developed in a certain period of time where the new changes weren't contemplated and making appropriate adjustments. Take the issue of bonding, for example.

The current amounts set in the statute are a reflection of what was deemed to be appropriate back in 1984, over 25 years ago. If the policy imbedded in the statute is to avoid having the public assume the risk of replacing a water supply, of restoring a pad site or plugging a well, then the

amount of such bonds should reflect those costs. So whatever adjustments you believe are appropriate to that, we would support.

With regard to the proposed amendment to require disclosure of chemicals in hydrofracture treatment, let me just offer that the public's right to know and it's expectations for transparency in government have never been greater than the are now, and certainly are far greater than they were in 1984. We have seen quite a bit of misinformation and misconception surrounding this issue, so we applaud the effort to establish a clear disclosure policy in law. Be clear about what it is that should be disclosed and have it in the statute and then it becomes a non-issue.

I would only note that with regard to the actual provisions in the legislation, the proposed legislation, the disclosure requirements are limited to the Marcellus. Arguably, they could be extended to any hydrofracture operation, regardless of the target formation involved. If it's appropriate to disclose hydrofracture chemicals related to hydrofracture mixes, it doesn't matter whether it's the Marcellus, the Utica, or some other formation for which that treatment is being applied.

Let me also speak to the suggested modifications to the rebuttable presumption provisions of Section 208. Of note is your desire to extend the presumption to the diminution of water supplies. This is a very notable thought. We deal with diminution issues all the time, and they are very problematic.

But I just want to caution --- and this it not a philosophical issue, this is a drafting issue, quite honestly --- that you can have problems with the expansion of this to diminution. First and unrelated to natural gas, whenever you have multiple sources pulling from the same aquifer --- we're not talking about withdrawals --- you often see diminution but it does not affect the ability of someone to continue to use their source of supply for the services intended.

In other words, you can have de minimus, inconsequential losses or diminution to the aquifer that don't affect anybody. What you're interested in is that level of diminution that causes harm. Read literally, this language could apply to the de minimus situation.

Secondly, the amount of pre-drilling testing needed to establish a baseline would be significant. And everyone needs to understand that.

You have wet years, you have dry years, and you have regular seasonal changes in the water table that all have to be factored into establishing that baseline in order to make pre-drilling surveying an appropriate and effective tool. We would suggest that you give those issues some consideration as you deliberate this legislation. Again, those are drafting issues.

With respect to your request for comments on mitigating environmental risks associated with drilling in the Marcellus in general, let me speak to the Commission's role and the steps we've taken to minimize environmental impacts related to water use by this industry.

First, and as we've noted in prior testimony before this Committee, our business is water resource management. It's not mineral resource development. We don't regulate drilling. We don't regulate the production or transmission of natural gas, nor do we regulate the treatment, disposal and reuse of flow-back and production fluids, including brines. What we do regulate is the withdrawal and consumptive use of water associated with natural gas development.

Our management objective is to have the industry avail itself of the water resources in the

basin and the development of this important mineral resource, but to do it in a way that minimizes impact to the basin's water resources. It was the Spanish philosopher Santayanna who said, those who cannot remember the past are condemned to repeat it.

In the past, as Representative Carroll noted, we have seen mineral exploitation occur at the expense of society, where the environmental risk was not mitigated but instead transferred to the public. We don't want to repeat that history and perpetuate that legacy and we don't need to. We need to be smart and we need to use the lessons that we've learned.

One of the things we realized almost immediately when the Marcellus Shale industry came to town was that our traditional regulatory scheme did not fit the type of activity that this industry was undertaking. In short, we realized that we needed to modify that regulatory approach, not to change our substantive standards to protect the environment, protect the water users, other water users, but to administratively change how we manage it to make it more effective.

Within the last 18 months we have undergone three different regulatory changes in order to improve that regulatory program. Given our

concerns for potential environmental impact, I will tell you that we effectively eliminated our standard regulatory thresholds that we use for all other industries. For this industry, our regulatory authority starts with the use of gallon one.

Although we've made specific rule changes related to this industry, I should point out that we have not modified any of our current standards or requirements associated with the review and approval of water withdrawals. The natural gas industry continues to be subject to the same standards that all withdrawals across the basin are subject to and we believe are appropriate to protect our water resources as we simultaneously allow for their utilization to support this important industry and in fact all industries across the basin.

With regard to the evaluation of withdrawals, we look to whether a proposed taking should be subject to a protective passby flow condition, which restricts the ability to take water during low flow conditions. This essentially cuts off the withdrawal when flows reach a certain threshold in order to protect in-stream habitat and other downstream users.

We undertake that evaluation using

criteria that is applicable to all surface water withdrawals, not just those requested by the natural gas industry. This protocol enables us to evaluate the impact of the withdrawal, and involves looking both upstream and downstream to assess cumulative impact, taking into account all other withdrawals and discharges and their impact on the resource, particularly during low flow conditions.

To date we have issued 110 surface water approvals to the natural gas industry, most of them involving a passby condition to protect stream flow. We have not seen the industry turn to the groundwater resources yet, but we anticipate that happening in some of the glaciated regions of our basin given that base flows in those regions are not well-equipped to sustain depletion during low flow conditions.

I will tell you that I found out today on the way here that we have, in fact have two applications for groundwater withdrawals. They're the first in the two years since the Marcellus industry came to town. But I should note that, because it changes my testimony. With regard to groundwater, I will tell you that the Commission has a very robust aquifer testing protocol that must be utilized by anyone who's proposing a withdrawal, and it's designed

to make sure that those withdrawals do not negatively impact the aquifers from which the water's being withdrawn.

We also have approved 20 public water supply systems as sources for water and have an additional 11 systems currently under review. Interestingly, the industry has turned to these systems to supply approximately 45 percent of the water used in the Marcellus Shale play, at least in our basin. For the industry it's a matter of economics. Where it can find water closest to its drilling pad site, it minimizes transportation costs.

Thus far we've approved over 500 drilling pad sites and there are some preliminary findings that are starting to come back. We require post-hydrofracture reporting for all the operations that are done on these pads. We have been building a fairly good database, and we're now at a point where we can start doing trend analysis and compile real data, profile data on how water is being used by this industry.

So that you know, about 87 percent of the water that is actually withdrawn by the industry is used for drilling and hydrofracture, and the total amount used to date in our basin --- this is roughly

an 18-month period ending on the beginning of the year --- totals 262 million gallons of water. On an annualized basis, this represents 480,000 gallons per day. Half a million gallons per day is the annualized average, if you will, of water used by this industry. To put that in perspective, a single scrubber on a power plant uses about 5 million gallons a day on one plant.

Of the amount used for the industry, 55 percent comes from surface water withdrawals, 45 percent, again, as I noted earlier, from public water supply systems. The average total volume used in each frac operation is 2.7 million gallons of water, of which 2.2 is fresh and the other is recycled flow-back. The average recovery of fluids injected, at least in the reporting that has occurred to date, is approximately 13.5 percent. That is the recovery. And of that amount, approximately 60 percent has been reused, and 20 to 40 percent disposed of for treatment.

What this means on the disposal side is that we're looking at about approximately 4 percent, actually closer to 4.5 percent of the water that is used for hydrofracturing operations goes out for disposal. That's a fairly low number. It's much

lower than we had anticipated. This represents the current information we have, the current water use profile data that we have, and we would be happy to provide the Committee with additional information as it becomes available and report to you perhaps annually or at some other frequency.

I also want, for the record, to note that the Commission is now in the process of deploying a remote water quality monitoring network that will continuously measure and report water quality conditions on smaller rivers and streams located in the northern tier of Pennsylvania and the southern tier of New York, i.e. in the watersheds where there's active Marcellus development activity occurring. I'll note that in this county, Clearfield County we have two monitoring stations that are about to be deployed, one in the Little Clearfield, one in Trout Run.

We've got 30 stations across the northern tier of Pennsylvania that are going in as we speak. This is a real-time monitoring system that is being designed to allow access to the data collected to other resource agencies and to the public. These locations will have passive solar units and be able to communicate with cell technology and satellite technology, provide that information to our website

and we will make that available to the public. You will have real-time access to data on an ongoing basis.

And we hope to deploy --- phase one is 30 stations. We hope to be doubling, tripling, quadrupling the number of stations over time. They are expensive to develop. I want to compliment East Resources. One of the companies decided they think the industry should live with transparency. They did provide us with a $750,000 grant to pay for some of this equipment, which we greatly appreciated.

But we have built some momentum and some interest in this data system because it does provide the transparency that the public wants, and it gives us an opportunity, everyone an opportunity, to see whether there are conditions that are changing out there in the streams, particularly the smaller order streams to help monitor the situation. We will continue to provide that value added service to the Commonwealth as we move forward with this activity, and I thank you again for the opportunity and look forward to your questions. Thank you.

CHAIRMAN GEORGE:

Well, thank you for your testimony. You'll stand for questions, should there be any?

MR. BEAUDUY:

I would welcome that.

CHAIRMAN GEORGE:

We'll turn to the one on my left, gentleman, Mr. Gabler.

MR. GABLER:

Just one quick question. You mentioned that, interesting statistic, 87 percent of water being withdrawn is being used for the drilling and hydrofracture. Where's the other 13 going?

MR. BEAUDUY:

Primarily for dust control on sites.

MR. GABLER:

Thank you very much.

CHAIRMAN GEORGE:

I thank the gentleman. Representative Hutchinson?

CHAIRMAN HUTCHINSON:

Just a quick comment. I'm impressed by your real-time monitoring system. It sounds real state of the art and it also, as you pointed out, shows what can happen when you work with an industry.

They do want to, I think in most cases make sure that everything's aboveboard. And if they're going to be a partner in helping you afford

this kind of monitoring system, that's phenomenal. And I just want to congratulate you on your forward thinking in getting this up and going. Thank you very much.

MR. BEAUDUY:

Thank you.

CHAIRMAN GEORGE:

Representative Barbin?

MR. BARBIN:

No questions.

CHAIRMAN GEORGE:

Representative?

MR. CARROLL:

Just one quick question. Can you tell me what the typical surface water sources are? Is it the Susquehanna River itself or other sources?

MR. BEAUDUY:

No, they're not. And the biggest issue with withdrawals, quite honestly, is not the quantity of water, because this industry is really not using, in a relative sense, not using a lot of water. The problem is it's the timing and location of the withdrawals. Because a lot of this activity is occurring in our smaller order streams, you know, in the upper watersheds, where even a small withdrawal

can have an impact. And so that is the major concern.

What we do, when an application comes in, regardless of whether it's a smaller order stream or on the Susquehanna itself, we are requiring contemporary aquatic resource survey data. If the Fish Commission had just done, or DEP or someone else had just done a reach of stream, we'll utilize their data. But by and large the industry pays us an additional $5,000 to $10,000 for us to put out and conduct an aquatic resource survey where we're looking at not only habitat but we're looking at upstream and downstream water uses.

We're looking at flow dynamics, the hydrograph for that stream, and we're making a determination about whether that withdrawal can be sustained without impact on low flow conditions. And if not, we impose the passby flow requirements. That is why the industry, even though it's only using a half million a day, has asked us for over 100 million gallons a day in approvals. Because they want them to be centralized all over, they want to be able to grab water where it's available when it's available.

And seasonally they know that there are going to be times when they're not going to be able to go to these streams and get water, so they're starting

to think more about staging the water in order to be able to do that.

MR. CARROLL:

Thank you.

CHAIRMAN GEORGE:

Just one final question, if you will. The amount of drilling in the coming years, and the activity's going to double or even triple, would that be sustainable in terms of available water supply?

MR. BEAUDUY:

We believe, at this point, Representative George, that it will be. And I say that for the following reason. We are looking at withdrawals. We had predicted and our prediction --- and the assumptions that we're making, we don't have a lot of good science for. But we looked at what happened in the Haynesville. We looked at what happened in the Fayetteville formation. We looked at what happened in the Barnett down in Texas. We looked at the potential here, and we made a determination.

Based on the amount of use we saw occurring in those formations and what was likely to occur here, that on an annualized basis we're probably talking about 28 million gallons a day. Now, we're only at a half million right now, so it could double.

It could go up tenfold this year and it would still only be five million a day.

In the scheme of things, I will tell you that the power industry's withdrawing 3.4 billion a day in this industry. And I can tell you that the golf course industry is using more than ten times the amount that the Marcellus Shale industry is using, in fact for more than that. So in a relative sense, it's not a lot of water. Again, the issue is where are they taking it, when are they taking it, what are the size of the streams that they're taking it from. That's where there's a potential for conflict, and that's why we've imposed the standards that we have.

Because you're right, as this increases --- and I'll give you an example. You know, historically our Commission has approved 50, 60, 70 projects a year. Last year we approved about 100. The past month we've had over 100 applications submitted. This is really starting to take off, Chairman George, and I believe that your concern is extremely valid. It is something that we're trying to stay on top of, and that is, what's the cumulative impact of this industry going to be as it builds out?

We think we are monitoring that. We think we have a handle on it, and we will put

appropriate controls in place if we think that it is getting beyond the capability of the resource to sustain it. And not just in this industry. But that resource has to satisfy a greater public. It has to satisfy other industries, public water supply systems and the like and try to balance all those interests at the same time.

CHAIRMAN GEORGE:

Wouldn't it be somewhat practical, rather than go into the ground and utilize the hydrology remaining in the stratosphere, or in the earth, wouldn't it be somewhat reasonable to utilize water that's been affected by previous industries and then recycle that water and use it and then recycle it, and prevent the use of new hydrology. You know, there are times when unfortunately I disagree with you.

In this area here we haven't had the precipitation in the past couple years that we've had prior to that. Wouldn't it be appropriate to utilize water that's been affected by other industries, rather than go into the ground and take water that might be very scarce?

MR. BEAUDUY:

Absolutely. And we've tried to incentivize that. Let me tell you how. In two ways.

Number one, take A.M.D. for example. If there are operations that are proposing to utilize A.M.D. as opposed to freshwater sources, we are providing waivers on the fees associated with the review of those applications.

Secondly, to the extent that --- for all this, we consider all this water use to be consumptive when lost to the basin. And there's a mitigation standard that has to be met. If they are reusing wastewater, if they are reusing flow-back, if they are using A.M.D. water, any lesser quality water, they do not have to meet those mitigation standards. We are trying to incentivize and direct the industry to utilize the least quality of water to preserve our pristine resources for other uses, particularly human uses.

CHAIRMAN GEORGE:

Thank you for your testimony.

MR. BEAUDUY:

Thank you.

CHAIRMAN GEORGE:

We will now be calling --- I hope I pronounce it appropriately --- John Baillie, Senior Attorney, PennFuture, Pittsburgh office.

CHAIRMAN HUTCHINSON:

John, they've been holding the ---.

ATTORNEY BAILLIE:

This, yes.

CHAIRMAN HUTCHINSON:

Yes, yeah. Make sure it's turned on and ---.

ATTORNEY BAILLIE:

Here (indicating)?

CHAIRMAN HUTCHINSON:

No, the other end. That one.

ATTORNEY BAILLIE:

Okay. Thank you.

CHAIRMAN HUTCHINSON:

Thank you. You can start when you're ready. Thank you.

ATTORNEY BAILLIE:

Okay. Chairman George, Chairman Hutchinson, members of the Committee and distinguished guests, I would like to thank you for this opportunity to comment on House Bill 2213. My name's John Baillie and I'm a senior attorney for Citizens of Pennsylvania's Future.

PennFuture is a statewide public interest membership organization with offices in Harrisburg, Pittsburgh, Philadelphia, West Chester and Wilkes-

Barre. PennFuture's purposes include advocating and litigating on behalf of the environment and public health on a statewide basis.

House Bill 2213 proposes to make a number of changes to the Oil and Gas Act. The Act has not been amended in any significant way since it was put in the books in 1984. PennFuture agrees with the sponsors of the bill that there's a need to revisit many of the Act's provisions in light of the development of Marcellus Shale, which presents a set of challenges that could not have been anticipated in 1984. We commend Chairman George and the other sponsors of the bill for taking the first steps needed to respond to those challenges.

With that in mind, I offer these comments to the bill. First, the bill would impose a number of new requirements of wells drilled into the, quote, unquote, Marcellus Shale, and with good reason. Wells are being drilled into the Marcellus Shale at an increasing rate, and these wells use drilling techniques including high-volume hydraulic fracturing and horizontal drilling that increase the potential for pollution.

However, the Marcellus Shale is not the only gas bearing geologic formation in Pennsylvania.

Those same drilling techniques are likely to be used to extract gas from other formations in the future. Drilling in those other formations is likely to raise similar water pollution concerns to those that we see in connection with the Marcellus Shale.

Accordingly the bill should be revised throughout so that the protections extend not only to the Marcellus Shale gas wells but also to any gas extraction activities that use high-volume hydraulic fracturing and horizontal drilling techniques, regardless of the formation they tap into.

Second, Section 208 of the Oil and Gas Act creates the presumption that any pollution of a source of water that occurs within 1,000 feet of a gas well and within six months of drilling results from the drilling and creates an obligation for the well operator to replace or restore the polluted water source. The bill would amend Section 208 to extend its protections to the sources of water within 2,500 feet of a gas well.

It's important to bear in mind that although the presumption created by Section 208 carries with it a benefit for those who live close to gas wells, it also creates a burden. To take advantage of the presumption, the person who owns or

uses a water source within a zone protected by Section 208 must incur the expense of having both the water quality and flow rate of the water source tested by a certified laboratory after receiving notice that drilling is set to occur.

In setting the size of the zone protected by Section 208, the General Assembly should balance the likelihood of pollution against the cost of the tests that owners of water sources must have performed in order to take advantage of those protections.

Experience has shown us, however, that there is justification to extend the zone protected by Section 208 from the current 1,000 feet. In Dimock Township in early 2009, drilling activities at a Marcellus Shale gas well contaminated at least one water source that was 1,300 feet away from the well. In light of that occurrence, the zone protected by Section 208 should be extended so that all water sources that could be adversely affected by nearby drilling activities receive the full protection of the Act.

Third, the Oil and Gas Act currently does not purport to require gas well operators to disclose any information about the chemicals that they use during the drilling process. Nevertheless, DEP

already requires companies drilling in Marcellus Shale to disclose the ingredients of the fracturing fluids that they use and make a list of those ingredients available to the public on the DEP website.

The bill would add a Section 208.1 to the Oil and Gas Act, which would also require the well operator to disclose to DEP a list of the chemicals that they use in the hydraulic fracturing process and would further expand well operators' disclosure obligations to include the formulas for those chemicals and the concentrations of drilling fluid's chemical constituents.

Many of the known chemical constituents of drilling fluids are hazardous and toxic. Requiring well operators to disclose which hazardous and toxic chemicals are present at the well site is critical so that the well site --- well operator's employees, DEP and local emergency personnel can respond appropriately if there's a spill or release at the site.

However, it also appears that manufacturers of fracturing fluids can legitimately claim that the concentrations of the fluids' various ingredients are confidential trade secrets. Well operators purchase fracturing fluids but may not be

privy to the concentrations of the ingredients within the fluids. Consequently, it may be impossible for them to disclose those concentrations to DEP

The purpose of allowing well operators' employees, DEP, and local emergency personnel to respond appropriately to spills or releases should be adequately served if lists of fracturing fluids ingredients used at each gas well are disclosed to DEP and made available to the public and emergency responders. Accordingly, sponsors of the bill should consider removing the requirement that well operators disclose the concentration of the ingredients in the fracturing fluids in order to avoid imposing an obligation on drillers that they must fight, but that will produce little, if any, extra marginal benefit to the public, while retaining the other provisions of the proposed Section 208.1.

Fourth, Section 215 of the Oil and Gas Act imposes a bonding requirement on well operators to ensure that Pennsylvania's taxpayers are not forced to bear the expense of plugging old and abandoned wells if the operators of those wells fail to comply with their obligation to do so. The bill would amend Section 215(a) of the Oil and Gas Act to increase the bonding amount for gas wells, most significantly to

$150,000 per Marcellus Shale well.

The bonding amounts currently in the Oil and Gas Act were set in 1984 and have not been changed since. They are inadequate. Sponsors of the bill have recognized they need to be increased significantly to account not only for inflation that has occurred since 1984, but also for the increased pollution or potential for pollution that results from new drilling techniques now used across Pennsylvania.

PennFuture supports increasing the bonding amounts for the gas wells so that they accurately reflect the costs of plugging wells and restoring well sites and protect Pennsylvania taxpayers from the burden of well operators' failures to comply with their obligations under the Oil and Gas Act.

And fifth, since I came up here from Pittsburgh and I live in the city, this is a point that's near and dear to my heart. Section 602 of the Oil and Gas Act currently states that local ordinances that are enacted pursuant to the Municipalities Planning Code or the Flood Plain Management Act that purport to regulate oil and gas well operations are preempted by the Act. The bill would amend Section 602 to clarify that such local ordinances are

preempted only to the extent they purport to regulate oil and gas well operations and that to the extent local ordinances would regulate other aspects of oil and gas well operations, including time and place of those operations, the ordinances would not be preempted by the Act.

We believe the proposed amendments to Section 602 are consistent with recent decisions of the Pennsylvania's Supreme Court that confirmed the traditional power of municipalities to regulate the time and place of gas drilling operations within their boundaries, and also recognize that by the Oil and Gas Act, the Commonwealth reserved for itself the power to regulate the manner of operating gas wells within Pennsylvania.

However, PennFuture notes that the Marcellus Shale underlies all the City of Pittsburgh and that gas drilling has been proposed for sites within the city already. Because the Pittsburgh City Code was not adopted pursuant to either the Municipalities Planning Code or the Flood Plain Management Act, the power of the City even to assert its traditional zoning powers over gas drilling operations is questionable. Accordingly, we urge that the bill be amended to include ordinances that are

validly enacted under the Second Class City Code so that the City of Pittsburgh can assert its traditional zoning powers over the gas drilling in the same manner as other municipalities across the Commonwealth.

Thank you for giving me and also PennFuture this opportunity to comment on House Bill 2213. I welcome any questions that you might have for me.

CHAIRMAN HUTCHINSON:

Thank you. I'll start with one question, and maybe it's --- it may be exciting, because I think I agree with you on something. I just wanted to clarify. You're saying that your organization believes that because of the technical problems in finding out the exact concentrations by the well operator themselves in the fracing fluid, that the cost benefit and all the hassle is really not worth it. You're just saying your organization believes the only thing that's necessary is that the actual chemicals themselves are available onsite and available to the public, and the specific recipes, as it were, are not necessarily or shouldn't necessarily be required in every case. Is that a fair statement of what you're saying here?

ATTORNEY BAILLIE:

Well, I guess I'd characterize it differently.

CHAIRMAN HUTCHINSON:

Okay.

ATTORNEY BAILLIE:

I would say that we believe that it's of paramount importance that the constituents be available to and publically disclosed. I mean, it would be a terrible shame if a local emergency responder got a mouth full of stuff and died as a result of it because he didn't know what he was dealing with.

We also think that to get, to get the concentrations disclosed is going to a burden, tremendous burden for industry, but also that all the environmental and public health concerns that would be served by making the concentrations publicly available are pretty much going to be met if the ingredients themselves are available. You know, whether a given well uses eight parts per million chemical X or ten parts per million chemical X in its frac job probably doesn't make all that much difference in the long run.

CHAIRMAN HUTCHINSON:

Thank you. And that's what I thought. I appreciate that. We'll start with questioning,

Representative Carroll.

MR. CARROLL:

None, thank you.

CHAIRMAN HUTCHINSON:

Representative Barbin?

MR. BARBIN:

I have one question. I was looking at your testimony, page five of seven. Do you have a specific suggestion for the Committee to review as it relates to a bond amount? Because on page five you indicate that there's $150,000 per Marcellus Shale well, and then on the others you indicate on the next page that D.C.N.R. has already used $125,000 bond requirement when it's leasing its acres to --- is there a suggested amount that you think will cover the bond, you know, the bond amount that's needed 20 years in the future?

ATTORNEY BAILLIE:

I'm not sure what it is. I've heard anywhere from $12,000 a well to $150,000 a well.

MR. BARBIN:

Has there been any study that you're aware of that indicates how much really is needed 20 years from now if there are problems with an individual well?

ATTORNEY BAILLIE:

No, not that I'm aware of. I do want to mention, though, currently it's at $2,500 a well, and that will not --- that doesn't even pay the guys to come out.

MR. BARBIN:

I understand and I agree with that suggestion.

CHAIRMAN HUTCHINSON:

Representative George?

CHAIRMAN GEORGE:

Well, I imagine that you disagree with this in your statement. Both the Chesapeake Energy and Range Resources CEOs McClendon and Pinkerton have stated that the companies providing frac solution should make full disclosure and should not make trade secret claims. They dismiss the notion that disclosure would take away a company's competitive advantage as silly. I guess you disagree with them, from what I've heard you say.

ATTORNEY BAILLIE:

I don't disagree with them, but ---.

CHAIRMAN GEORGE:

Well, then why didn't you say that?

ATTORNEY BAILLIE:

Well, here's why. We'd like to see this bill passed, and we'd like to see it passed in as close to current form as it is. And we wonder whether it will be able to be passed if you include, you include the requirement that drillers disclose the concentrations of the frac --- of the constituents in their fracing fluid. So rather than take nothing, we'll take 99 percent.

CHAIRMAN GEORGE:

This is just my opinion, but I think others will be supportive of it, but we have great technology and very brilliant people in this country of ours. We can make various forms of energy and various forms of different capacities, but there's one thing that we can't do. We can't make water. And any time, even though I'm supportive, but there's been cases where an individual's water has been disrupted or changed in some way.

Very possibly you haven't been aware of areas where water, especially a source that's come into a community has affected 80, 90 or 100 people with intestinal disorder and sometimes worse than that. I think if we don't protect our water and make sure it's okay, we're doing an injustice to the people we serve.

ATTORNEY BAILLIE:

I agree with you 100 percent, Chairman George. But as I explained to Chairman Hutchinson, I question whether any extra protections are provided by the requirement that the exact concentration of chemicals within fracing fluid --- whether any extra benefit is provided.

CHAIRMAN HUTCHINSON:

All right. Thank you. Thank you for your testimony and for your answers to our questions. Thank you.

CHAIRMAN GEORGE:

The next testifier will be Kathryn Z. Klaber, President of the Marcellus Shale Coalition, and David Spigelmyer, Vice-Chairman of the Marcellus Shale Coalition. Welcome to the both of you.

MS. KLABER:

Thank you. Thank you very much. Chairman George, Chairman Hutchinson, thank you for inviting us to be here today. My name's Kathryn Klaber. I serve as President and Executive Director to Marcellus Shale Coalition. I'm here with David Spigelmyer, who's Vice-Chairman of our organization and also Vice-President of Government Relations for Chesapeake Energy.

Dave and I are both natives of Pennsylvania. He hails from DuBois, just right down the road. And I grew up in Beaver County, studying environmental science in central Pennsylvania at Bucknell University, starting my family and career in Philadelphia and then back in the southern, southwestern part of the state, where I now live.

And both of us are here today very much in the spirit of making Pennsylvania, our native Pennsylvania a great place to work, live and raise a family. We also each have a lifelong appreciation of the many natural beauties of Pennsylvania, ardent proponents of keeping Pennsylvania's environment protected for generations to come. And indeed environmentally responsible development of Marcellus Shale is the cornerstone of our organization's mission.

As Chairman of this Committee, Chairman George, and the State Representative of Clearfield County since 1974, we certainly recognize your historic commitment to conservation of the environment and appreciate the Committee's review of this very important subject, as you have been very clear about the need to maximize the real economic opportunity of the Marcellus Development without jeopardizing the

environment. And on that goal we are all today, I think, on the same page.

When you speak of the economic opportunities, I'm sure you're considering the tens of thousands of landowners across Pennsylvania, including many right here in Clearfield County, who are anxiously anticipating the wealth creation and the significant royalties contemplated when they signed their leases, royalties that will not be realized until Marcellus producers can extract the gas, prepare the gas and ultimately transport it to market.

And you clearly understand the need to enforce existing environmental regulations in Pennsylvania and, where appropriate, provide modernization of the existing Oil and Gas Code. We need to modernize this, set it in statute, to reflect the current technology and today's modern shale development.

We collectively must get this right. We don't want to deny the benefits of this resource to Pennsylvania. There are extremely important economic, environmental, and energy security benefits to using natural gas in the Commonwealth and in the country. And getting this right will require policy makers to take a hard look at all of the legislative proposals

that impact Marcellus development, as well as an honest assessment of the arguments proponents use to push this legislation.

I'll respect the time limits imposed on the testimony today, and it'll be an all-too-brief presentation of these very important and sometimes complex issues. However, I encourage the Committee and the folks here in attendance to access the plethora of information on our website at www.pamarcellus.com and to reach out to me or any of the member companies of our organization on issues that may not be covered in sufficient detail today.

We structured our formal comments to address three of the major issues identified by Chairman George. First of all, casing and cementing wellbores. Secondly, hydraulic fracturing fluids. And third, equipment disinfection. First, I'd like to address development of a well, the associated casing and venting of wellbores.

Industry does know from drilling thousands of gas wells that proper drilling, casing and cementing is essential to secure the maximum yield from those wells and to protect the water tables. That's why we're working so closely with DEP, the lead regulatory agency, to determine and impose best

practices as it relates to this activity.

As you probably know, this issue has recently been addressed in significant detail by the Oil and Gas Technical Advisory Board of the DEP. That group of regulators, industry representatives, academia, and representatives of the public interest have spent many hours and multiple sessions developing a sound approach to updating 25 PA Code Chapter 78, covering the construction of oil and gas wells. That proposed rulemaking was published in the Pennsylvania Bulletin on January 30th and proposes numerous modifications regarding the drilling, casing, cementing, testing, monitoring and plugging oil and gas wells to enhance the protection of drinking water supplies.

I believe this Chapter 78 process is a current and very prime example of how the natural gas industry is developing the Marcellus Shale while working right alongside regulators to establish the most protective and workable rules. Let me provide several examples of how the process worked and the outcomes that are reflected in this draft rulemaking.

First, the parties needed to establish an enforceable way to make sure that the initial well casing was properly positioned. The industry

committed to using a technology called a centralizer to ensure that the casing cement is evenly distributed around the well casing. The parties identified new recordkeeping and reporting, with the industry supplying more data to the agency and to those inspectors. Third, the industry will develop casing and cementing plans for each well that will be available for review and inspection onsite by DEP inspectors, and new inspection requirements are being established to require operators to perform mechanical integrity tests at least quarterly, with the results recorded and retained and, again, available for review by the Department.

As you know from an announcement several weeks ago by the Governor, DEP will be hiring more staff to help implement these rules. And the Marcellus Shale Coalition did issue a statement following that announcement. And in that statement we talked about our support of both the permit fee increases that were accepted by the industry in order to support this additional 68 DEP staff and to continue to work very closely with the agency on enforcement and in permit issues.

There are a series of successive steps used to develop a well, and we've heard about some of

these today. But I just wanted to make sure on the record that we've talked about this, those redundancies, in providing layers of protection to the groundwater.

First, a conductor pipe is used to stabilize the well bore, and that happens at the beginning of the process. And next, the well is drilled to a depth of several hundred feet below the freshwater zones. The pipe is set and cemented back to the surface to protect the water table. This represents the first level of protection for fresh water, steel pipe and cement, between the gas that will eventually flow through the well and the surrounding groundwater.

Next, another section of the well bore is drilled to beyond 1,000 feet, and again that well casing is sealed, seated, and the annular space is filled with cement back to the surface. And now we've got a more solid defense from any gas migration into freshwater zones. And at this point the bottom of the well runs deeper than any freshwater zone. And finally the well bore hole is drilled to the total depth and a final production string is run and cemented back to the surface. So I think through that process and through the additional review of Chapter

78, you've got a really good program in place to continue to protect groundwater in Pennsylvania.

The second topic I wanted to address was the fluids used for hydraulic fracturing. This is another way where --- or another place where Pennsylvania deserves to get the facts about water management for Marcellus Shale development. The actions of industry, the regulatory agencies and the legislature must be --- the actions must be based upon these facts. And furthermore, we must all work together to make sure we are certain to be responsive of public concern.

The fact is that Pennsylvania's regulations governing the use and management of water needed to drill a Marcellus well are among the most stringent in the nation and ensure the protection of the Commonwealth's water resources. Water withdrawal from streams and rivers must be approved, as we've heard from the previous testimony, including the withdrawal location, the amount of water required for each well, as well as detailed storage and treatment plans.

The industry currently treats or recycles all of its flow-back water. Recycling accounts for approximately 60 percent of the water used to complete

Marcellus Shale wells, with greater percentages predicted for the future. And some of our companies are already achieving recycling rates of this water at 90 percent or better.

As I'm sure we all recognize, this recycling greatly reduces the amount of water that needs to be treated and returned to waterways, and also reduces the amount of fresh water that's withdrawn. There are more than a dozen approved water treatment facilities available to treat flow-back water, with plans for additional capacity underway.

One other item that we heard about in the previous testimony is the use of various sources of acid mine discharge water that is very much being used by some in the industry. And we're going to see attempts to make that an even more prevalent part of the water sourcing in the future.

Companies are working with international water quality experts funding research and development projects to develop mobile and permanent treatment technologies such as evaporation and crystallization. These efforts will enhance the Commonwealth's overall water treatment capabilities, beyond just the natural gas industry, while bringing more commerce into Pennsylvania.

We're also researching reliability of using deep underground injection well technology. It is a proven safe disposal method in other regions of the country. It has also been endorsed by Secretary Hanger as an important wastewater disposal option in Pennsylvania.

The industry's committed to using best management practices in all aspects of its operations, including significant investment in advanced flow-back water treatment capabilities and recycling technologies and will continue to innovate for additional solutions in this area. So, you know, in conclusion on that issue, I think it's very important to see that there is no one single, correct way to address water, water disposal. We need a menu of all very safe options that make water disposal a important part of what Pennsylvania can do to develop this resource.

With respect to the disclosure of the components of the fracturing fluid, and notwithstanding some of the misleading statements we've heard to the contrary by those who would appear to want to see this Marcellus opportunity for Pennsylvania fail, the information is available on these components in multiple places. Just like in

other regulated industries, the natural gas industry complies with the Federal Occupational Safety and Health Administration rules, the OSHA rules that require that M.S.D.S., material safety data sheets, to be onsite disclosing the components of the products in use. And let me, let me be clear, the Marcellus Shale Coalition absolutely supports full disclosure of chemical constituents, just like it's done in other industries across the country and right here in Pennsylvania.

Furthermore, I urge the Committee and the entire General Assembly to spend some time reviewing another website, energyindepth.org, which confronts a host of misleading arguments that anti-Marcellus groups and individuals have made with respect to the fracing process, with a particular emphasis on the following notion, that far too many continue to ignore, "no groundwater pollution or disruption of underground sources of drinking water has been attributed to hydraulic fracturing of deep gas formation." Importantly, this statement comes from our own Pennsylvania Department of Environmental Protection and has been echoed by state and federal regulatory agencies across the country.

This site, Energy in Depth, also

addresses the federally proposed FRAC Act, which is, in short, a solution looking for a problem, and that this solution would effectively eviscerate the DEP's current permitting role, as well as add tremendous costs and significant, significant delays to the permitting process. If enacted, the Federal FRAC Act will directly hurt landowners in Clearfield County, as well as other Marcellus producing counties throughout the Commonwealth. I urge you all to reach out to the Pennsylvania delegation and convey your opposition to this very short-sighted legislation.

I think there's a lot of important issues on water that have been brought up today, putting use into perspective. The monitoring that is being done in the western branch of the Susquehanna, as well as other places around the Commonwealth ask how companies such as these resources --- they're an active member of our organization --- has looked at putting their own resources into creating a transparent situation. Total dissolved solids, that issue deserves more transparency, more data to understand the nature of the issue.

The last issue that I wanted to address was around equipment disinfection. The disinfection of drilling equipment that is used at Marcellus Shale

drilling sites needs to be better understood, as well.

Given the magnitude of the impact at Dunkard Creek, it is very understandable that sadness can be followed by outrage, and I don't think any of us enjoyed at all seeing what had happened in that creek. But the headlines and the content that ran in the media used baseless suppositions to try and blame Marcellus drilling for that tragedy.

Even after the December headline, E.P.A. pins killing of Dunkard Creek on mine discharges, the innuendos have created a connection in the public's mind that somehow the Marcellus drilling was at fault.

It's really important that we start with the facts. Most of the Marcellus drilling rigs were custom-built for Appalachia, never drilled a well in another area of the country and, therefore, thereby highly unlikely carriers of algae from other regions.

Drilling equipment is pressure-washed, cleaned following operations before being moved to another location here, including those imported from other states to develop wells in Appalachia.

The golden algae that was identified in the Dunkard Creek incident is found in more than 32 states and across the globe. It is not uncommon for these types of organisms to transfer from watersheds

on a variety of vehicles, fishing equipment, migrating birds and others.

In conclusion, I just want to highlight an issue that has not been the subject of this hearing, because this is the Environmental and Energy Committee, because it's a very, very important part of this Marcellus development, and that's jobs. Because we ask our elected officials all the time to create new opportunities for jobs, opportunities that will allow us to stay in Pennsylvania, to raise our children here, and hopefully someday our grandchildren here, and to keep them, you know, close to home. I think the Marcellus Shale has clearly given us the kind of opportunity that we've asked for for years and years.

In this room I think everybody agrees that environmental protection's absolutely a critical factor involved in this industry, and let's all work together to ensure that the economic opportunity is all that it can be. Thank you.

CHAIRMAN GEORGE:

David?

MR. SPIGELMYER:

Thank you, Mr. Chairman. Mr. --- Representative Hutchinson made the comment, Chairman

Hutchinson, right off the bat that we need to do this right. Indeed, the goal of the Marcellus Shale Coalition is for the environmentally responsible development of this resource.

As well, Chairman George, you made a comment in the beginning that this is not a new industry in Pennsylvania. I wanted to make a couple observations to share with you. We drill 4,000 conventional natural gas wells in the Commonwealth. We've done it since 1859 at the Drake Well in Titusville. This is not new to Pennsylvania, but this has the potential to be a game changer.

We produce about 25 percent of the natural gas that we consume today in the Commonwealth, 182 billion cubic feet of natural gas, compared to about 810 billion cubic feet of the natural gas we consume. So why is this a game changer? Marcellus has the potential to assist us in all of our manufacturing products. If you think about natural gas being the primary feed stock fuel for all steel, glass, plastics, chemicals, fertilizers, powdered metals, pharmaceuticals, some electric generation. And even vehicles today, just to go to east of here, the State College bus fleet runs entirely on natural gas. It's an extraordinary opportunity, we have the

technology today to use in our transportation fleets, and we need to do more of that.

Why is this important to you and your constituents? I wanted to share with you a couple comments on that point. First of all, is utility bills. Folks that consume natural gas in their homes, they receive a bill that shows the commodity charge and the demand charge on their bill. A few people know what the demand charge is, but they don't realize that the other 75 percent of the natural gas that comes to Pennsylvania, it comes here through long-line pipelines. I think Chairman George used to work for a pipeline company a long, long time ago. But nonetheless, those long-line pipeline companies deliver gas from the Gulf of Mexico and Midwest. That demand charge could be as high as $2 an Mcf in units that's delivered to the home. That costs your constituents dollars.

And you think about the price of natural gas today being $570 or $575 on the open market, the transportation unit being $2 alone, you're talking over 35 percent of the product delivery to the home is subject to that transportation charge. I think that's a big deal.

We have the Marcellus natural gas

available right under our very feet in the Commonwealth. I'm not telling you we could eliminate that demand charge, but I think we can reduce it dramatically and provide cheaper energy for our --- not only our industries, but our commercial operations and the residents here in the Commonwealth.

I also wanted to share with you what I think is a conservation measure attribute. We talked about 4,000 natural gas wells that we've drilled conventionally in the Commonwealth. We'll likely never get to 4,000 wells in the Marcellus industry. This past year we drilled probably 700. We're probably at a little over 1,000 Marcellus wells in the Commonwealth in a little over two years. This year there'll be about 5,000 permit requests delivered to the Department of Environmental Protection. About a third of those will get developed. I'm guessing in the neighborhood of 1,500 wells will be developed in the Commonwealth. Why is that important for us?

If you think about it, it took 4,000 wells to produce 182 billion cubic feet of natural gas. We think in less than five years, if we can move Marcellus development towards the 3,000 number, then we can be self-sufficient in Pennsylvania, producing more than we can consume. That's a key point for us,

I think, moving us to a level of independence.

If you look at the key attributes of natural gas in this United States, it's almost 100 percent domestically produced. So from an energy security standpoint, it's very crucial. From an environmental standpoint, when you talk about generating electricity, it's about 45 percent less carbon than coal, 30 percent less than oil, dramatic reductions in sulfur dioxide and nitrogen oxide and emits virtually no particulates. It's an environmental winner and its right here in Pennsylvania.

I also wanted to share with you some of the economic attributes of Marcellus development in Pennsylvania. Few folks have focused on the big picture, the amount of dollars already being generated for an industry in climb.

I joined the company that I work for just a year ago. I was employee number 220. Today we're at 973, and by the end of this month we'll likely be over 1,000 employees employed right here in the Commonwealth, paying our taxes, you know, building our homes and working in our communities.

Last year alone we've estimated over $395 million dollars in state and local taxes were

generated, hotel and motel tax, food and beverage tax, sales tax, personal income tax, capital stock and franchise tax, corporate net income tax. Extraordinary opportunities. Over 48,000 jobs generated in Pennsylvania last year, and estimated by the end of this year we'll exceed 79,000 jobs in the Commonwealth and probably more than a billion dollars of economic output in terms of state and local tax revenue, royalty income on state lease plans as well as state lease opportunities for us.

So those are a few observations I have. I'd be happy to stand for questions and appreciate you having this hearing today.

CHAIRMAN GEORGE:

I thank the both of you for your testimony. I'll turn to Representative Carroll.

MR. CARROLL:

Thank you, Mr. Chairman. I'm intrigued with the prospect of 90 percent recycling of the water and wonder if we could expect the use of A.M.D. water since the technology's advanced to that point.

MS. KLABER:

Yes, I mean A.M.D. water is already being used by certain companies that are in the right location to use that A.M.D. water that is proximate to

their operations. There are continuing abilities for companies to use new A.M.D. water, but you know, I can't give you an exact number on that.

The recycling is where, you know, there's been so much innovation in a very, very short period of time. Over the last, you know, six to nine months, reaching that level of 60 percent overall with some companies at 90 percent and up, that has changed, really, the game in terms of what we expected, what DEP expected when they put the proposed strategy together for T.D.S. Thought it was going to be 100 percent of the water used needing to be treated, and we're well, well below that. So those are two, two great opportunities in the right direction.

MR. SPIGELMYER:

I'd just make a comment on the issue of disposal. I think a number of our companies would like to see disposal options continue to develop in the Commonwealth.

The company that I work for, we have 23 rigs operating in Pennsylvania right now, primarily in the northern part of Pennsylvania, north central Bradford County and Susquehanna Counties. We're recycling almost 100 percent of the water that we produce from our well operations. And frankly the

issue on disposal options and treatment options, we're worried about one day when, you know, when the amount of water that we generate exceeds our need in the future fracing operations. When I talk about recycling, we capture that water in steel lined tanks. We filter that water and mix it with our next frac job, meaning we need less water on the front and we mix it with fresh water.

When the day comes when we're not producing as much or may have a shortage of capital, we may need some disposal options. So that still remains as an item that we would like to see developed in the Commonwealth. We think the capitalist approach will likely bring treatment technologies to Pennsylvania. But now, and we think it's a good solution for Pennsylvania, we're reusing almost 100 percent of the water we produce.

MR. CARROLL:

Well, to the extent that you have to augment that water, I really would ask the industry to take a look at the A.M.D., especially in the northeast part of the state. It's a colossal problem that's really a challenge to solve. And to the extent that you could use A.M.D. when augmented --- you need to augment the water supply really would be a great

benefit for a host of us for all sorts of reasons.

MS. KLABER:

Absolutely. And I think it's a win-win, both taking away that legacy problem and then taking away some of the T.D.S. loading that's associated with it.

MR. CARROLL:

And then just broadly, you know, the hearing today is on the bill. And I really didn't hear a whole lot in the testimony in opposition to the various components of the bill, with possible exclusion of the, you know, the disclosure of the components. Broadly speaking, the bill as drafted, does the industry have --- are we getting any --- some sort of a quiet endorsement of this approach?

MS. KLABER:

No, I think that there's some elements of the bill that are repetitive of existing rules that are already, you know, on the books. So I do think that some of the elements of the bill either are not necessarily required to be able to do some of the things that the industry's already been doing.

MR. SPIGELMYER:

Well, I also want to mention, this industry has worked very closely in partnership. We

need to work in partnership with our regulators and with our legislators, and you have our commitment to work closely with you on this.

MR. CARROLL:

And that would be my final comment. I mentioned it to the Department earlier, and I mentioned it to the industry that we had to get this right. I was mentioned in the testimony but, you know, we just can't have a repeat of mistakes that were made in the past. You know, this generation, future generations are going to count on us to get this right.

And you know, I lived a stone's throw from the Kwonkat (phonetic), that is an absolute eyesore and it generates an orange stream that flows towards the Lackawanna River. We can't have those kinds of occurrences happen again. And it really is incumbent upon all of us to get this right.

MR. SPIGELMYER:

Representative Carroll, I can't say it any other way. This isn't yesterday's coal industry, we're a highly regulated industry and we share the same goal. We know that the billions of dollars that have been invested in the Commonwealth, that if we don't do it right, they'll end pretty quickly.

CHAIRMAN GEORGE:

Mr. Barbin?

MR. BARBIN:

Thank you, Mr. Chairman. I have two, two quick questions. And thank you for your testimony today. I do think that this is a game changer for Pennsylvania, and how we go about balancing putting additional people to work with protecting our natural resources will be the difference as we come out of the recession.

But with that said, there is a perception by the public that some of the jobs that have been created by the industry have been taken by out-of-state workers who finish a job and go back to Oklahoma or West Virginia. And what is it --- that is the perception, but what is it that the industry can do so that we can ensure that when we make these balances, that the people who need the jobs --- we're still at ten percent unemployment --- are coming from our communities that will also have the drilling rigs in their backyards?

MR. SPIGELMYER:

Representative Barbin, there's a couple of answers to this that I'd like to share. First of all, the Marcellus Shale Coalition has begun working

in coalition with our community college system, our college systems and our technical schools, primarily Penn College, to try and develop a workforce training initiative to prepare our students in Pennsylvania for some of this work.

Admittedly there are some jobs that have come from the Gulf Coast states in Pennsylvania, a highly technical operation on the larger rigs that have never operated in Pennsylvania. These rigs are called triples. They can handle three strings of drill pipe 30 feet in length on each, on each drill rig.

Many of those jobs, the fact that gas prices went from $14 an Mcf to $3 an Mcf, many of the rigs in the Gulf Coast states were laid down. Some of those technical operations on the rig floor have come from the Golf Coast states into Pennsylvania. These are 12 hours a day, 14 days on and then get 14 days off. A lot of those folks have indeed come to Pennsylvania.

But all the water hauling, rock hauling, construction of the well pad, environmental work, engineering work, those have been jobs filled by Pennsylvanians and will continue to be filled by Pennsylvanians.

As well, we'd like to prepare our workforce through a workforce training initiative on rig training to make sure we're preparing students that may not be of a geologic engineer ilk to get on the rig floor and work with us in training programs, and we're working to try and develop some of that here in the Commonwealth.

MS. KLABER:

And I'll give follow-up, Representative. You talked about, at the beginning, a question about the balance between jobs and the environment. A lot of these jobs, like the ones Dave mentioned at Chesapeake, are in the environmental field. I mean these advances in recycling are being done by environmental civil engineers. Some of our associate members of the Marcellus Shale Coalition are environmental firms who are the consultants doing a lot of this work on treatment.

So there are jobs. We're not only balancing the economic and the environmental, but a lot of these jobs are in environmental professions.

MR. BARBIN:

And my last question would be this. I agree with Representative Carroll, that the A.M.D. discharge water is a really good place to try to make

a win-win is for DEP. As I understand, the industry problem is with the total dissolved solids being both salts as well as metals. But if you were --- if the State were to maybe encourage the use of that A.M.D. water, you know, treated properly so that it could be used for fracing (phonetic) purposes, you would actually be encouraging the water systems themselves to be better than they can now be because there's a limited amount of money that we have for A.M.D. projects. And there are more than enough A.M.D. projects that are still on the boards that could be started if we could have a revenue source that will allow more of those projects to get up and running.

So my suggestion is that the industry ought to be working with DEP right now while you're doing T.D.S. standards to say, we're also looking to move our water withdrawal requirements from A.M.D. And if it means that we need to come up with a tax credit if you do use A.M.D. water, we should be doing that, because the overall question is, how do we make our waterways cleaner? That's the overall question.

It doesn't matter whether it has this many parts salt or this many parts metal. It's the overall water quality that we're all interested in. Thank you.

MS. KLABER:

I have a clear take away from both your comments today, and we'll take that back to the Coalition.

CHAIRMAN GEORGE:

I was about to caution you, David, but I've allowed a lot of flexibility. Are you done, Mr. Barbin?

MR. BARBIN:

I'm done, Mr. Chairman.

CHAIRMAN GEORGE:

Only because you blew the whistle on me working in the piping industry.

CHAIRMAN HUTCHINSON:

We can strike that from the record, I guess, Mr. Chairman. I wanted to go to a technical thing that was mentioned by two of our previous testifiers. I assume you've heard the talk about --- and this is in the bill itself, regarding the diminution of water supply, the drafting, the way that's talked about. Could you comment on that?

A, do you see the same drafting kind of problems, and B, is diminution something that's already covered or not? I think there's --- that's sort of something new to me today, I think.

MS. KLABER:

You're talking about the assimilative capacity of --- and we did in, actually in my previous role before taking this job, looked at 30 years worth of data from DEP, across the ten most largest waterways in Pennsylvania. Total dissolved solids has been an issue in all of those waterways at various times over that course of 30 years.

You know, this is not a new problem. T.D.S. is a fluctuating compound, and it has been assimilated in different ways in different watersheds around the Commonwealth. In our comments on the T.D.S. rule, we talked very much about having a watershed by watershed approach. And then in stream requirements are much more appropriate to the watersheds and are also much more economically feasible. So assimilative capacity is absolutely there.

We don't want to play games with it in any way, hence the additional monitoring that is very important to have. So you know, to answer your question about assimilative capacity, we use it every day. We use it when we brush our teeth and use that to get the toothpaste out of our mouths. But I think we have to be careful where there are problems because

of significant legacy challenges that we are managing our outfalls appropriately. And the places that have a tremendous amount, seasonal and otherwise, we need to use that capacity responsibly.

CHAIRMAN HUTCHINSON:

Could you also comment on the numbers that are in the bill for the bonding requirements, cost of plugging? Are those in the ballpark, high, low? What does the industry think about that at this point?

MR. SPIGELMYER:

I think there were comments made that industry can turn around and walk way from a well if they don't want to have to plug it. That's not correct. I mean as long as you're an active company in the Commonwealth of Pennsylvania, that well belongs to you and you're required to plug it appropriately if there's no longer gas producing from that well.

You know, we're happy to --- you know, we've never plugged a horizontal developed Marcellus well today, and those are 10,000 foot shoots, likely, in most cases or more. I think the Marcellus in Pennsylvania is 7,000 feet deep to 8,000 feet deep. Our horizontal laterals have gone out and they input at 5,000 feet, as far as 5,000 feet. So we've not

plugged a horizontal lateral well in the Commonwealth.

I'm happy to work with you on that, but I would share with you, I think it's inaccurate to say that a company can turn around and walk away from an obligation just because they don't want to incur that expense. We're always responsible for that wellbore.

CHAIRMAN HUTCHINSON:

And with leeway, can I ask one more question, Mr. Chairman?

CHAIRMAN GEORGE:

Sure.

CHAIRMAN HUTCHINSON:

And this actually is not covered in the bill itself, but it is one of the issues that's out there. You and the industry are well aware of the Governor's proposed severance tax and what that may or may not do to the future development of this industry. And if you could give a brief comment about where, you know --- what your thoughts are on that issue and how it will effect your industry going forward?

MS. KLABER:

I'll give a brief statement and then Dave can add to it, but Dave very accurately put forth in his comments a billion dollars will be collected by state and local governments in tax revenue this year

from the Marcellus industry. That's before any new severance tax is put in place. That tax revenue will only grow if we work in partnership to develop this resource. And that in fact can happen and will happen without the severance tax. Economics 101, the more you tax something, the less you get of it. I think that what we really want to focus on here is sustainable development of this industry for the long haul in Pennsylvania, making sure to modernize the statutes, like we've all talked about today, where that's appropriate, and making sure that it's a successful economic opportunity for all of us.

MR. SPIGELMYER:

Just a follow-up comment, there are four major shale plays across the United States, the Haynesville in Louisiana/Texas, the Fayetteville in Arkansas, the Barnett in Texas and the Marcellus. The Marcellus has gained a good bit, good bit of the capital because of its proximity to markets. But I would share with you, we're on a very, very sensitive balance. And we're building the foundation right now for the long-term sustainable growth of this industry.

It's not just the investment and the leasing of lands and the building of a well site. It's the construction of compression facilities, the

building of stripping capacity. Most folks don't realize what that is, but in the southwest and central part of the state, the out streams have heavy hydrocarbons in it, ethane, pentane, butane, isobutene and propane. They're a project process, a freezing process that allows the capture of the propane and those pieces from the natural gas stream. There are millions and millions of dollars to develop those facilities. Those kinds of investments are being made today.

And the big one I didn't mention that all of you know is the next stage of this, and that's the development of the necessary pipeline infrastructure to move it to market. That's a big, a big investment that needs to be made in this Commonwealth. It's going to require a lot of capital, and pipelines are absolutely critical if we're going to get the gas from these well.

Many of the wells that are being drilled right now in the Marcellus have no access to pipeline capacity yet. They're being drilled and shut down or shut in until we can get pipelines developed to get that gas to the major interstate transmission facilities to get gas to market. So my point is, is that we need to be pretty, pretty cautious and allow

this industry to take root in Pennsylvania before we saddle it with something that may make it uneconomic to invest in Pennsylvania, and grow the jobs necessary for this industry.

MS. KLABER:

And Chairman Hutchinson, all that investment that they've talked about was private sector investment. And I think what's very important here is these are private sector dollars from out of state, in a lot of cases, coming and investing in growing jobs here and building capital here. And we wouldn't want to mess with that. This is another place where we need to do it right.

CHAIRMAN GEORGE:

Let me say something to both you. I've allowed a lot of flexibility. You know, you're not doing us any favor. You're coming in to get the gas under our land, and we welcome you because we know it will create jobs. But while you're talking about millions, you're going to make billions. And the truth is that we're responsible as legislators to protect this land that belongs to the people.

Now, when I read some of the dialogue, where we know that there are out-of-state trucks, that's no issue to me. I don't care how many out-of-

state trucks come in. But to tell me they're all disinfected is not true, because other states don't have a law to make sure that we're not getting algae from some of those vehicles.

Now, again, God put the Marcellus Shale there. We ought to be able to get it. There'll be people that will find jobs, and that makes every one of us in this room happy. But they wouldn't be so happy if they turned the spigot on and found out there was no more water. So you know, we don't have to keep on this.

The truth is that we want to work together, but don't come across trying to tell us that there haven't been problems. Already there's a problem in the northeast from drilling in the Marcellus Shale. We're not going to get into the fact where you can drill horizontally and you go 5,000 feet and maybe into somebody's property that didn't lease you the gas. We're not going to get into that. We want you to be up front with us so we can do the best for both sides. I turn to you, Mr. Gabler.

MR. GABLER:

Thank you, Mr. Chairman. I can't help but smile when I look at the panel here. I feel like I'm looking a little bit in the mirror. I see a

Bucknell alum and a DuBois native, so I welcome you both.

I really just had a quick question with regards to you mentioned in your testimony the evaporation and crystallization technologies. It's my understanding that these are not deployed as of yet; is that correct?

MS. KLABER:

Not extensively in Pennsylvania for salt removal from the water.

MR. GABLER:

Are they in other areas?

MS. KLABER:

Crystallization and evaporation can be used, as I understand, in the mideast to desalinate. It's a very energy-intensive process to literally drive all the water off of the salt.

MR. SPIGELMYER:

I believe there is one plant operating in north central West Virginia right now.

MR. GABLER:

I just was wondering if I could ask for your comments on the economic feasibility of this or your outlook for it in the future. Being that it is so energy intensive, will it be, will it be something

that's economically feasible in the coming years in the near future?

MS. KLABER:

It's hugely energy intensive, as you point out. The cost for a single facility, you know, can be in the hundreds of millions. What I see is crystallization evaporation being one option for the long term so that the Marcellus industry does have options for safe and environmentally sound disposal. I'm certainly not ruling that out.

At this point the costs are prohibitive, not just for the natural gas industry, but as the DEP's Water Resources Advisory council has been meeting on various technology options to meet the 500 parts per million proposed T.D.S. level. There are not very many ways to reach T.D.S. on the outfall but evaporation crystallization.

Some of the manufacturers have talked about the fact that those are --- that's a job, you know, a job-killing kind of cost. And there were several manufacturers in that series of testimony that said they would need to move their operations with that kind of cost. We believe with the natural gas industry, again, that it should be part of the overall set of options. And we'd love to see it continue to

become more cost-effective moving forward.

MR. GABLER:

So can I ---? Mr. Chairman, thank you.

CHAIRMAN GEORGE:

Sure.

MR. GABLER:

Mr. Spigelmyer, from your own company's experience, you had mentioned that the way that you are proceeding is that you have some flow-back from a well and you can reuse that by diluting that with the additional water that you need to do the next well. So that is how you're currently handling it. But at some point in the future you're going to need a disposal technique, and that's why it's important for us now to be working towards that?

MR. SPIGELMYER:

We certainly wouldn't want to dismiss that as an opportunity for us, absolutely. We think there's going to need to be disposal options in the future. Right now we're recycling nearly 100 percent of our produced water from the frac process.

MR. GABLER:

Thank you very much. I appreciate your testimony. And thank you, Mr. Chairman.

CHAIRMAN GEORGE:

Now, again, this won't be long or deliberate. Kathryn, you're first. Ladies first. Now, you quoted the following statement: no groundwater pollution or disruption of underground sources of drinking water has been attributed to hydraulic fracturing or deep gas formation. Isn't that statement just a little misleading, because due to the federal exemption under the Safe Drinking Water Act, DEP wasn't even doing any tests to see if there was any causation between drilling and water pollution incidents, and the DEP just followed the E.P.A.?

And two, there are court cases alleging the attribution, although it has not yet been proven. And I imagine these cases many times will get stalled and we'll never know the causation. Isn't that really true?

MS. KLABER:

Chairman, the connection between natural gas from deep shale and groundwater is not just DEP. Thirty (30) agencies, the Groundwater Protection Council have all determined that there is no link between the groundwater natural gas and deep well natural gas production. I absolutely stand by that comment, and it's not just my comment. Plenty of experts across ---.

CHAIRMAN GEORGE:

That's what they say, but you and I both know it isn't true.

MS. KLABER:

I disagree with you. I know ---.

CHAIRMAN GEORGE:

Thank you for being honest. And David, and David, your turn. Since you're from DuBois, you're not too far away from Venango, and you state that you --- drilling has been around for thousands of years, I know. I was invited up when I became a chairman in '81 to Mr. Hutchinson's to see the Drake Well where water, red water comes out and spews all over the place. And I daresay, you better bring beer because there's no clean water up there to drink.

But now because the legislature is on the ball, as they were not at one time, when the coal or any other facet of industry took over, and we allowed a lot of pollution of water, we welcome you, we welcome your industry. We want to work with you, but I'm going to continue to remind you, this belongs to the people, the same people that we represent. And we'll be watching. And we'll be helping where we can.

So I thank you for your patience and your testimony. I thank all of those that have testified,

and most of all I thank all of you that are here because I know you have a legitimate interest. God bless you, and thank you all. We have one statement. Tom, do you want to make it?

MR. KUHN:

Yes, sir. I'm Tom Kuhn. I'm the Executive Director for Mr. George, Chairman George. We brought 60 copies with all the testimony plus the pamphlet. Obviously the numbers weren't enough. For those of you that didn't get copies, we have a roster to sign in. Put your name, your e-mail, and I will see that you get an electronic copy tomorrow. Thank you very much.

CHAIRMAN GEORGE:

Now, there's one other statement I want to make, and I don't want it on the record.

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HEARING CONCLUDED AT 3:07 P.M.

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CERTIFICATE

I hereby certify, as the stenographic reporter, that the foregoing proceedings were taken

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