Testimony of
Ray N. Walker, Jr.
Senior Vice-President – Marcellus Shale
Range Resources – Appalachia, LLC

To
The Pennsylvania House of Representatives
GOP Policy Committee

Chairman Saylor, Representative Reed and members of the GOP Policy Committee, thank you for allowing Range Resources to offer testimony on developing natural gas reserves in Pennsylvania's Marcellus Shale. I hope that the information presented here will help the Committee to develop rational public policies that encourage development of this vast energy resource beneath our feet while protecting the environment and allowing Pennsylvania to reap the enormous economic benefits that can result from orderly development.

First a brief background on me and Range Resources. Range Resources is the largest natural gas producer in Pennsylvania. Our heritage dates back more than 25 years in Pennsylvania and we currently operate nearly 5,000 wells in the Commonwealth. Range is an S&P 500 company, headquartered in Ft Worth, Texas with drilling operations in the Southwest, Appalachian and Gulf Coast regions of the United States, with a regional focus on Marcellus Shale development. Our company was the first to pioneer development of the Marcellus Shale in 2004 and has unlocked this tremendous opportunity for Pennsylvania and the nation. We currently employ more than 300 Pennsylvanians and have a regional headquarters in Washington County. Our current drilling activities support more than 1,000 additional industry jobs through our subcontractors and several times that many indirect jobs. I am an officer at Range Resources, currently serving as Senior Vice President of the Marcellus Shale. Having spent my career in this industry, I have experienced first-hand the huge economic opportunities that natural gas development can bring to a region. During my career I have never witnessed an opportunity as large as the one before us today with the Marcellus Shale.

Few Pennsylvanians by now have not heard or read about the Marcellus Shale, the organic-rich black shale that underlies over half of the Commonwealth. Estimates of potentially recoverable natural gas from the Marcellus have reached 500 trillion cubic feet, enough to meet America's needs for over 20 years at current demand levels. Reserves at this level could make the Marcellus larger than the largest oilfield in the world (Saudi Arabia) and make it the second largest natural gas field (largest in Qatar/Iran). Over the past several years, estimates of potential natural gas resources in the U.S. have surged to over 100 years worth as a result of unlocking the immense gas deposits in the Marcellus Shale and other gas shales like the Barnett, Haynesville and Fayetteville Shales. In recent months, another name, the Eagle Ford Shale, in south Texas has been touted as the next super gas field. There will be others in the U.S. and Canada as companies target other known organic shale deposits. This enormous supply of clean burning natural gas can be used to significantly reduce our dependence on foreign oil and change our nation's energy policy for many decades to come.

Attached is a summary of the current state of Marcellus Shale development in Pennsylvania which is not the direct subject of this hearing but which certainly needs to be considered in order to develop appropriate public policy.

The balance of my comments will focus on water issues related to Marcellus Shale development in Pennsylvania. Range Resources and the natural gas industry are keenly aware of the need to protect Pennsylvania's rich water resources and other natural resources. While our companies are expecting to profit from Marcellus Shale development, we fully understand that if we do not "get it right", the resource will not be effectively developed in Pennsylvania and our profits will never materialize. Our company and others have not only worked with regulatory agencies to achieve a high level of environmental protection but have reached out to numerous environmental advocacy groups to better understand issues of concern and how our industry can improve best practices.

The impact of Marcellus Shale development on Pennsylvania's water resources has been the topic of much debate, as it should be. In today's information age, it is unfortunately very easy to get information that is not accurate. I hope that the information presented here will increase your understanding of Marcellus Shale development.

The following discussion will address water protection issues through various parts of the drilling process.

Site Construction

Construction of drilling sites, access roads, pipelines and water impoundments all require an ESCGP-1 (Erosion and Sedimentation Control General Permit) if construction activities for any substantially connected activity will disturb and area greater than five acres. Most excavation of large areas such as well sites and water impoundments are pre-engineered and many are constructed with high tech satellite GPS control. Following grading, all disturbed areas are either permanently stabilized with crushed rock or seeded and mulched to achieve vegetation. A variety of best management practices such as sediment traps, ditches, culverts and various types of silt fencing are applied using DEP guidelines to control runoff.

Once drilling or other operations are completed at a site, the area is re-graded, original topsoil is re-spread and the area is reclaimed. Permanent production facilities, which occupy a small fraction of the original drilling pad, can be reclaimed and returned to their prior use.

Ground Water Protection

Protection of ground water is accomplished by methods that are employed during the drilling of a natural gas well. Pennsylvania has among the most stringent requirements for casing and cementing of natural gas wells to protect ground water. Marcellus Shale wells are typically drilled and cased in the following manner:

- The well is drilled to a depth of 30 – 60 feet or into bedrock where a conductor casing string is installed.
- Drilling proceeds to a depth at least 50 feet below the deepest known fresh water aquifer, where a water protection casing string is installed and cemented. Cementing of casing involves pumping cement down the inside of the pipe followed by a wiper plug and fresh water, which displaces the cement out of the pipe and it circulates around the outside of the pipe. By law, water protection casing must be cemented from the bottom to the surface.
- If any minable coal exists, drilling proceeds to a depth below the deepest minable coal seam where another, smaller diameter casing string is installed and cemented to surface.

- Drilling proceeds and, in many areas, another casing string is run and cemented to a depth ranging from about 1,500 – 2,500 feet. This string is usually designed to facilitate drilling by isolating zones that may produce oil, gas or salt water. This casing is normally cemented to the surface.
- Drilling then proceeds to total depth. In a horizontal well, total depth means the end of the lateral wellbore. A final production casing string is run and cemented through the entire lateral wellbore and frequently all the way to surface in the vertical portion of the wellbore.
- Casing sizes can vary, depending on the number of casing strings required. If all casings described above are required, typical sizes (outside diameter) are: 24" conductor casing; 20" water protection casing; 13-3/8" coal protective casing; 9-5/8" surface casing and 5-1/2" production casing.
- Freshwater aquifers are isolated and protected from injected or produced fluids by at least two but as many as four steel casing strings.

Although rare, drilling of natural gas wells can occasionally impact nearby water supply wells or surface springs and/or shallow ground water. Drilling through fresh water aquifers prior to setting surface casing is most frequently accomplished using air as the circulating medium to lift drill cuttings from the wellbore. The agitation caused by drilling through the water aquifer can sometimes cause cloudiness or sedimentation in a nearby water well. Because surface casing must be cemented from bottom to top, it is extremely unlikely that natural gas drilling can impact the water quantity in nearby water supply wells.

DEP has historically been very proactive in investigating claims of any water supply contamination or diminution resulting from oil and gas drilling and will issue orders to repair or replace any affected water supply at the driller's sole cost. Additionally, there is a rebuttable presumption against the oil and gas operator in the event of a contamination claim involving a water supply located within 1,000 feet of an oil and gas well. Water supply damage claims outside of 1,000 feet are also investigated by DEP and orders are issued for repair or replacement if it is determined that the oil and gas operator caused the impact.

Pennsylvania's casing and cementing regulations have served the Commonwealth well for the past 25 years since comprehensive casing and cementing standards were imposed by Act 223 and the Chapter 78 regulations promulgated under that act. Drilling and casing methods as they relate to ground water protection are nearly identical for Marcellus Shale wells as they are for the tens of thousands of traditional oil and gas wells drilled in Pennsylvania other than diameter of the hole and casing. In a letter to the Ground Water Protection Council in June, 2009, PADEP advised that it had issued 80 orders related to water supply impacts over the past 15 years. During that period, approximately 32,000 oil and gas wells were drilled in the Commonwealth, indicating an incident rate of 0.25%. In all cases, water supplies were repaired or replaced at the cost of the driller.

To put this number in perspective, consider a report issued last year by The Pennsylvania State University, funded by The Center for Rural Pennsylvania titled "Drinking Water Quality in Rural Pennsylvania and the Effect of Management Practices". That report found that over 40% of the approximately 1.2 million private water supplies in Pennsylvania do not meet safe drinking water standards, not because of oil and gas drilling, but because of poor well construction, sewage treatment practices, farming practices or other human and natural causes. The report found that 33% of the wells had Coliform bacteria and 14% had E Coli bacteria.

DEP has recently proposed changes to casing and cementing requirements for oil and gas wells in Chapter 78. Industry supports any science-based regulatory changes designed to correct identified deficiencies in the regulatory program. One of the primary drivers in DEP's suggested changes to casing and cementing regulations is the incidence of stray gas in ground water. Natural gas, primarily methane, is naturally occurring in many water supply wells in Pennsylvania. However, natural gas can also be introduced into ground water through the drilling and production of natural gas if casing is improperly installed or cemented, or if improper operating procedures are followed. It is important that all incidents of stray gas be thoroughly investigated to determine if proper casing and cementing procedures were followed or if regulatory requirements were inadequate.

Horizontal drilling technology

Horizontal drilling technology now allows the drilling of multiple wells from a single drilling pad, resulting in a far smaller environmental footprint from drilling versus the need to construct a separate drilling pad for each well. It is feasible in many cases to develop an area of 1,000 acres or more from a single drilling pad, with one access road and one pipeline, resulting in a total footprint of less than 1% of the developed area. To recover the same resource with vertical drilling could require 40 or more wells, each with its own drilling pad, access road and pipeline.

Horizontal drilling technology also offers latitude in the location of drill sites to avoid environmentally sensitive areas while still recovering the natural gas resource.

Hydraulic Fracturing

Hydraulic fracturing of a Marcellus Shale well involves pumping water, sand and several dilute chemical additives down the production casing. The process creates a network of fractures in the gas-bearing shale, exposing an enormous surface area of shale that allows the natural gas to escape from tiny micropores in the rock and flow to the wellbore.

There are three issues most commonly raised in connection with hydraulic fracturing:

1. Will using the volume of water required for hydraulic fracturing harm the environment?
2. Will the hydraulic fracturing process contaminate ground water?
3. Will the flow back water from hydraulic fracturing contaminate surface water or ground water?

1. Water requirements for hydraulic fracturing

A typical horizontal Marcellus Shale well requires 3 to 5 million gallons of water for hydraulic fracturing operations. Less than 1% of this amount is required for drilling operations so the hydraulic fracturing requirement is the main component of water use during the entire drilling and completion process.

To put this amount of water into perspective, if the water required to hydraulically fracture a single horizontal Marcellus well was spread over the approximate 80 acres that it drains, the water depth would be less than 2 inches. If we assume that it takes 50 years to develop the Marcellus Shale in Pennsylvania, that amounts to 0.04 inches of water per year over the total developed area, or less than $1/10^{th}$ of 1% of annual rainfall. If Marcellus drilling reaches 3,000 wells per day, about 5 times the drilling activity during 2009, total water use for hydraulic fracturing would be about 30 million gallons per day, or 3/10ths of 1% of all human water use in the Commonwealth.

The total water requirement for drilling and completing a typical horizontal Marcellus Shale well is about one gallon of water for each million btu of energy produced over the life of the well. According to a 2006 report by the U.S. Department of Energy, water requirements for deep shale gas production are significantly less than all other major types of energy. A summary of the findings is shown below

Energy Source	Gallons of water per million btu
Deep shale natural gas	0.60-5.80 gallons
Marcellus Shale gas – avg	**1 gallon**
Nuclear (uranium ready to use in a power plant)	8-14 gallons
Conventional oil	8-20 gallons
Synfuel - coal gasification	11-26 gallons
Coal (delivered power plant)	13-32 gallons
Oil shale	22-56 gallons
Tar sands/oil sands	27-68 gallons
Fuel ethanol from corn	2,510-29,100 gallons (irrigation)
Biodiesel from soy	14,000-75,000 gallons (irrigation)

There have been claims that water requirements for hydraulic fracturing will adversely impact Pennsylvania's surface or ground water. These claims are not valid.

Pennsylvania has vast water resources. Because of our topography and temperate climate, Pennsylvania has more surface water than any other state except Alaska. Water required for hydraulic fracturing can be easily withdrawn from Pennsylvania streams and rivers using common sense guidelines without adverse impact on stream uses. Simply put, water can be withdrawn from most streams and rivers at a safe rate during all but the driest periods without harming aquatic life or other downstream uses.

The Susquehanna River Basin Commission (SRBC) and Delaware River Basin Commission (DRBC) have regulated water withdrawal and use in their respective basins for many years. The regulations of these interstate compact commissions require extensive planning, analysis and monitoring of water withdrawals to insure environmental protection. Pennsylvania presently has no water withdrawal regulations. For stream withdrawals in the Ohio River Basin, Marcellus Shale drillers and DEP have agreed to adopt established SRBC procedures for stream withdrawal. Water management plans with specific plans for individual withdrawal sites and environmental safeguards are submitted to DEP for review and approval prior to any withdrawal.

Suitable water supply sources for hydraulic fracturing include:

- Water withdrawn from streams and rivers under carefully designed and DEP-approved water management plans
- Municipal water supplies
- Acid mine water, with appropriate pre-treating
- Other industrial or sewage treatment plant effluent, with appropriate treatment

2. Will hydraulic fracturing of Marcellus Shale wells contaminate ground water?

As described above in the Ground Water Protection section, all fluids conveyed into the well are done so through extremely well designed steel casing. Ground water aquifers are isolated from hydraulic fracturing fluids by multiple layers of steel casing and cement.

Fresh ground water exists only in rocks within the first several hundred feet of the surface in most parts of Pennsylvania. Below this depth, rocks contain salt water from their original deposition in a marine environment. The fractures created by hydraulic fracturing more than a mile below the surface cannot impact fresh ground water that exists only near the surface.

As previously mentioned, Pennsylvania's current regulations for well construction are among the most stringent in the country. Transporting and surface handling of chemical additives are strictly regulated by U.S. Department of Transportation, OSHA and other state and federal regulations just as are the thousands of other chemical products used in our society every day.

Hydraulic fracturing has been safely used in the U.S. for the past sixty years on over one million wells. Over 90% of the oil and gas wells drilled in the U.S. during recent years have required hydraulic fracturing to produce in economic quantities. Despite two nationwide studies by the U.S. EPA and numerous studies by individual states, there has not been a single case where hydraulic fracturing has been linked to ground water contamination.

Both the number and concentration of chemical additives used for typical fracturing of shale gas wells are minimal. Several dilute chemicals are added for specific purposes. A typical hydraulic fracturing solution for a gas shale well is described in a recent U.S. Department of Energy publication and is attached as Exhibit 1. The typical fracturing fluid contains about 90% water, 9.5% sand and about 0.5% chemical additives. OSHA requires a Material Safety Data Sheet (MSDS) for any potentially harmful substances handled in the workplace. MSDSs are also required under the Emergency Planning and Community Right to Know Act. A MSDS is required to disclose a variety of information about product contents such as boiling point, melting point, flash point, toxicity, health affects, first aid and reactivity. Of the 0.5% of chemical additives that make up typical shale well fracturing fluid, only about one-tenth or $1/20^{th}$ of one percent of the fracturing fluid contains chemicals that require disclosure on a MSDS. MSDSs are available on each site where chemical additives are being used. It is important to note that MSDSs describe impacts of the chemical compounds in their concentrated form, not the extremely dilute form that they are used in fracturing fluids. For example, the MSDS for Chlorine indicates that it is extremely toxic and can be lethal in its concentrated form, yet it is totally safe when diluted in drinking water or swimming pools.

A list of all chemicals disclosed on MSDSs for a typical fracturing fluid has been posted on DEP's website since late 2008. Industry is working with DEP to develop a process for updating this information on a periodic basis.

Again, all fracturing fluids are conveyed into a well and flowed back from the well through highly engineered steel casings, and multiple layers of steel casing and cement prevent any contact between fracturing fluids and ground water.

3. Will the flow back water from hydraulic fracturing contaminate surface water or ground water?

After hydraulic fracturing, the fracturing fluid is flowed back from the well, pushed out by the pressure of natural gas in the shale. One quarter to one third of the fluid injected flows back to the surface, much of the remainder being permanently bound in small microfractures created in the shale. The flow back water, having been in contact with the ancient marine shale, contains numerous naturally occurring minerals, primarily salts. The flow back water is collected on the site then removed by either truck or by pipeline and either reused or permanently disposed of at a permitted treatment facility.

Traditional treatment for natural gas waste water in Pennsylvania has been to remove heavy metals from the water such as iron, aluminum and manganese, then to discharge the clean brine to a large stream or river where the dissolved salts are quickly diluted to levels below those that could impact aquatic life. This process has worked well for many decades without significant environmental impact. Both DEP and industry agree that if Marcellus Shale drilling in Pennsylvania eventually grows to expected levels of 3,000 wells per year or more, about five times higher than experienced in 2009, the total dissolved salt in flow back water could exceed the assimilative capacity of some streams or rivers, particularly those that already have high levels of dissolved solids from coal mine drainage or other industrial activities. For this reason, the industry is working to develop management alternatives for flow back water.

The most common method of disposal for oil and gas field waste water world wide is by injection into deep, permeable rock layers that already contain salt water. At this point, very limited deep injection options exist in Pennsylvania although the industry will be exploring that option and it will likely be a part of the water disposal solution.

One of the most promising methods of dealing with flow back water is to reuse it for hydraulic fracturing of additional wells. This practice has not been widely used in development of other U.S. gas shales because those areas have had adequate deep disposal options. Even though recycling was only first attempted in the Marcellus in early 2009, by the end of 2009, Range Resources had announced that it was recycling 100% of its flow back water. The SRBC reported that for the fourth quarter of 2009, 60% of flowback water in that river basin, accounting for well over half of the drilling in the Commonwealth during that period, was recycled. It is expected that recycling of flow back water in the Marcellus will increase during 2010 and beyond.

Numerous thermal evaporation technologies also exist to remove salts and other dissolved minerals from waste water but they are both costly and energy intensive, and disposal of crystallized material may present additional environmental issues. It may be too soon to speculate on whether these technologies will play a significant role in management of Marcellus Shale flow back water.

Below is a table estimating the amount of waste water that may be generated by development of Pennsylvania's Marcellus Shale using the assumptions shown below the table.

Year	2009	2010	2011	2012	2013	2014	units
Est. % of flowback water recycled	50%	70%	80%	80%	80%	80%	%
New wells drilled	700	1,200	1,700	2,200	2,700	3,000	wells
Fresh water requirement	6.7	10.8	14.9	19.3	23.7	26.3	million Gals/day
Fresh water requirement - % of annual PA rainfall	0.015%	0.024%	0.032%	0.042%	0.052%	0.057%	%
Fresh water requirement - % of total PA water use	0.070%	0.113%	0.155%	0.201%	0.246%	0.274%	%
Waste water generated	1.0	1.0	0.9	1.2	1.5	1.6	million Gals/day

Assumptions:

- Drilling levels increase from 700 wells in 2009 to 3,000 well per year in 2014, approximating the drilling pace forecasted in the Penn State economic study in July, 2009.
- 4 million gallons of fracturing fluid pumped in each horizontal Marcellus well
- 25% of fracturing fluid flowed back to the surface
- The percentage of flowback water that was recycled during 2009 was 50%. That number is expected to grow to 70% in 2010 and plateau at 80% beginning in 2011.

With these assumptions, the volume of waste water generated is expected to slowly grow from about 1 million gallons per day in 2010 to about 1.6 million gallons per day in 2014, then plateau. To put this number into perspective, the amount of salt dumped on state highways each year (excluding the PA Turnpike and municipal roads) is equivalent to 8 million gallons per day of flow back water. The waste water estimate of 1.6 million gallons per day is less than 10% of the 19 million gallon per day estimate released by DEP in 2009, which assumed much higher flow back volumes and no recycling. Traditional treatment capacity for natural gas waste water in Pennsylvania is currently estimated at about 1.7 million gallons per day, of which about 1.2 million gallons per day is currently available for disposal of flowback water from Marcellus Shale wells. We believe that with the assumptions cited above, sufficient disposal capacity exists for Marcellus drilling activity over the next two years and that other management practices can easily handle incremental volumes of waste water in later years.

We are confident that with a cooperative effort between industry and regulatory agencies, Pennsylvania's Marcellus Shale can be developed without significant environmental impact so that the Commonwealth and the Nation can enjoy the benefits of this tremendous natural gas resource.

Thank you for allowing us to share our comments.

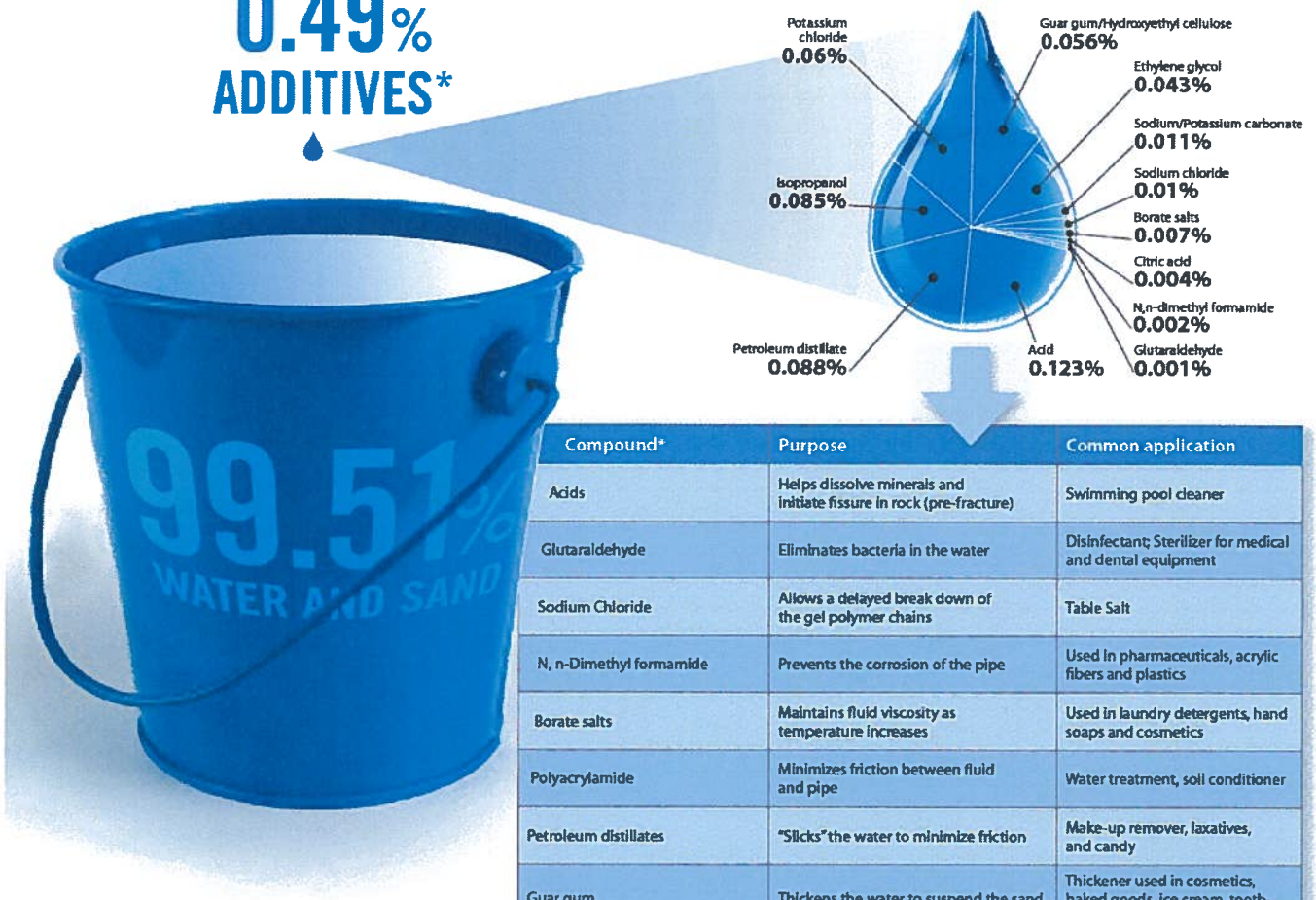
Ray N. Walker, Jr.
Senior Vice President, Marcellus Shale
Range Resources – Appalachia, LLC

Exhibit 1

A FLUID SITUATION:

TYPICAL SOLUTION* USED IN HYDRAULIC FRACTURING

0.49% ADDITIVES*



Compound*	Purpose	Common application
Acids	Helps dissolve minerals and initiate fissure in rock (pre-fracture)	Swimming pool cleaner
Glutaraldehyde	Eliminates bacteria in the water	Disinfectant; Sterilizer for medical and dental equipment
Sodium Chloride	Allows a delayed break down of the gel polymer chains	Table Salt
N, n-Dimethyl formamide	Prevents the corrosion of the pipe	Used in pharmaceuticals, acrylic fibers and plastics
Borate salts	Maintains fluid viscosity as temperature increases	Used in laundry detergents, hand soaps and cosmetics
Polyacrylamide	Minimizes friction between fluid and pipe	Water treatment, soil conditioner
Petroleum distillates	"Slicks" the water to minimize friction	Make-up remover, laxatives, and candy
Guar gum	Thickens the water to suspend the sand	Thickener used in cosmetics, baked goods, ice cream, tooth-paste, sauces, and salad dressing
Citric Acid	Prevents precipitation of metal oxides	Food additive; food and beverages; lemon juice
Potassium chloride	Creates a brine carrier fluid	Low sodium table salt substitute
Ammonium bisulfite	Removes oxygen from the water to protect the pipe from corrosion	Cosmetics, food and beverage processing, water treatment
Sodium or potassium carbonate	Maintains the effectiveness of other components, such as crosslinkers	Washing soda, detergents, soap, water softener, glass and ceramics
Proppant	Allows the fissures to remain open so the gas can escape	Drinking water filtration, play sand
Ethylene glycol	Prevents scale deposits in the pipe	Automotive antifreeze, household cleansers, deicing, and caulk
Isopropanol	Used to increase the viscosity of the fracture fluid	Glass cleaner, antiperspirant, and hair color

On average, **99.5%** of fracturing fluids are comprised of freshwater and compounds are injected into deep shale gas formations and are typically confined by many thousands of feet or rock layers.

Source: DOE, GWPC: Modern Gas Shale Development in the United States: A Primer (2009)

*The specific compounds used in a given fracturing operation will vary depending on source water quality and site, and specific characteristics of the target formation. The compounds listed above are representative of the major material components used in the hydraulic fracturing of natural gas shales. Compositions are approximate.

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PA Marcellus Update: March 31, 2010

Where we are as an industry

- 741 Marcellus wells drilled in 2009, nearly 20% higher than the 631 wells forecasted by last year's PSU study, despite natural gas prices 26% below the level forecasted.
- Major Marcellus drillers estimate 1,350 new wells in 2010; PSU Study forecasted 1,200 wells. Keep in mind that Pennsylvania's pre-Marcellus drilling activity for much of the past decade has hovered around 4,000 wells per year, second only to Texas in wells drilled for much of that period. Pennsylvania has 384,000 known oil and gas wells according to DEP and probably hundreds of thousands more that were drilled prior to record-keeping.
- Significant ramp-up of activity despite severe drop in natural gas prices which averaged over $9.04/mcf in 2008, $3.99 in 2009 and are currently forecasted to average $4.57/mcf in 2010. It still costs approximately $1 million more to drill identical wells in Pennsylvania compared to Texas for a variety of technical, regulatory and statutory reasons.
- Current PA Marcellus production for March, 2010 is estimated at over 500 million cubic feet per day, exceeding production from Pennsylvania's 50,000 traditional gas wells, more than doubling pre-Marcellus production.
- PA is now producing over half the natural gas we consume.
- Marcellus activity is expected to support over 100,000 new direct and indirect jobs by end of 2010.
- Industry is working with numerous community colleges, vocational technical schools, PA Career Link, regional workforce investment boards and many other channels to promote development of a PA workforce. The pilot program in western Pennsylvania has already graduated more than 100 displaced Pennsylvania workers with placement rate of more than 90%. These workers are currently earning more than twice the median income for the area.
- Marcellus drilling has already occurred in 24 Pennsylvania counties and will likely expand into at least 5 more counties during 2010.
- Production results from Marcellus wells are generally exceeding industry expectations of 2 years ago; reserve estimates released by public companies generally in the 2.5 – 5 bcf per well range, 15 -30 times higher than PA's traditional shallow gas wells.
- Development is quickly evolving to horizontal drilling; approaching 80% in Q4 2009; much higher in 2010; also evolving to multiple well pad drilling, draining up to 1,000 acres or more from a single 5-acre pad; very small footprint.
- All significant environmental concerns related to Marcellus Drilling have been addressed. While several minor mistakes have been made, industry has worked hard to improve and has avoided any significant events.
- Investment is flooding into Pennsylvania ~ $8 billion invested to date; expect $9+ billion in 2010. But the largest US independent producer Devon recently said that they would not invest in Pennsylvania due to "political issues."
- Because of development of the Marcellus and other U.S. gas shales, natural gas prices are now 1/3rd the cost of crude oil. This is currently saving PA natural gas consumers about $7 billion per year; about $1,000 savings for every household heating with natural gas.
- Still some regulatory uncertainty, but DEP has done very well to ramp up their agency to meet industry needs and protect the environment

Where we are headed

- PA's natural gas production will exceed demand within 2 – 3 years
- Industry will support 175,000 jobs by 2020
- Additional jobs—Not only in our industry but in manufacturing, as all steel, glass, plastics, chemicals, fertilizers, pharmaceuticals, powdered metals and other manufacturing and industrial operations use natural gas. Having abundant natural gas in our backyard will eliminate the long haul transportation charges paid today by all PA consumers to import gas from the Southwest and Rockies, providing us a competitive advantage for PA in energy costs.
- Every Pennsylvanian will feel economic benefits
- Lower cost, reliable natural gas will attract new business
- America can become much more energy independent

What Pennsylvania needs to get there

- Regulatory policy based on sound science
- Significant pipeline infrastructure
    - Mid-stream gathering pipelines to remote areas
    - Upgrading of interstate transmission system
- New natural gas markets – NGV's, electric generation
- Predictable business climate

Specific needs:

- Limit municipal regulation over drilling to provide state-wide uniform regulation, avoiding 1,000 different rulebooks
- Develop fair land pooling and royalty rules to promote orderly development of the Marcellus, minimize environmental footprint of drilling, maximize recovery of natural gas resources and provide equitable treatment of both leased and unleased landowners.
- Fix Coal & Gas Coordination Act – Act 214 – eliminate wasted cost to comply with nonsensical regulations impacting well spacing in coal-bearing areas
- Enact legislation that encourages use of PA-produced natural gas, for use as vehicular fuel, electric power generation, and displacement of home heating oil.

How Pennsylvania benefits (show charts):

- According to the PSU study, in 2010, industry will generate $603 million in revenues to the Commonwealth through CNI, PIT, Franchise, Sales and Fuel taxes. Combined with estimated local tax revenues of $269 million and expected revenues from leasing of state lands, the natural gas industry will contribute over $1 billion to the Commonwealth in 2010.
- A reasonable severance tax, if in place for all of 2010, would generate $25 million
    - Reasonable is defined as something similar to severance taxes imposed on shale wells by the other three big shale-producing states (Texas, Arkansas and Louisiana) with which PA is competing for drilling capital
    - No amount of severance tax will stimulate additional investment in Pennsylvania. An unreasonable severance tax, as suggested by the Governor, would only have the impact of slowing industry growth in PA and shifting some capital to other plays.
- **<u>PA needs to focus on how to grow the $600 million number</u>**