

MARCELLUS SHALE & HYDRAULIC FRACTURING

WHAT YOU NEED TO KNOW

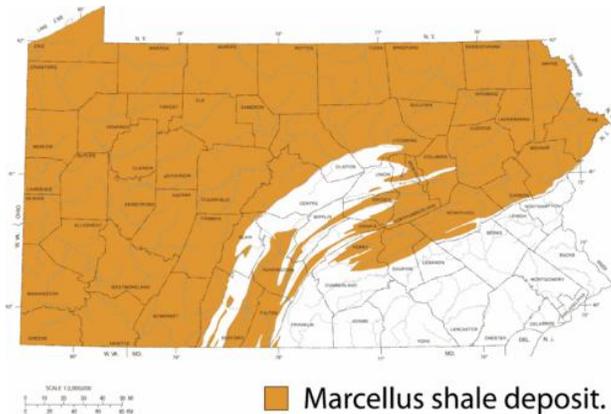
A REPORT BY STATE REPRESENTATIVE CAMILLE “BUD” GEORGE

CHAIRMAN OF THE HOUSE ENVIRONMENTAL RESOURCES & ENERGY COMMITTEE



BACKGROUND

Marcellus Shale is a natural subterranean shale formation that extends through New York, Ohio, Pennsylvania, and West Virginia. It spans across approximately 54,000 square miles and is located under 60 percent of Pennsylvania.



Source: Penn State College of Agricultural Sciences

Marcellus Shale is rich in natural gas that until recently had been difficult to extract. However, increased development utilizing horizontal hydraulic fracturing has made the extraction commercially viable.

Hydraulic fracturing is not new technology, but it has only recently become a wide-spread method of extracting natural gas from shale formations using horizontal drilling. Since 2000, approximately 10,000 wells have been drilled in the Barnett Shale of Texas, an area 1/10 the size of Marcellus Shale.

The viability of extracting Marcellus Shale gas has been seen as a bonanza for Pennsylvania. It is seen as a major fuel source at a lower cost to consumers than the current source of out-of-state gas, which is priced higher due to the expensive transportation cost.

Marcellus Shale gas can help reduce our dependence on foreign oil. Because natural gas is cleaner burning than other fossil fuels, Marcellus Shale gas can also help reduce air pollution and greenhouse gas emissions. But it also imposes a number of issues critical to the environment and public health that must be carefully examined, and this report covers several of those issues.

HYDRAULIC FRACTURING

Hydraulic fracturing, or “fracing” (pronounced as “fracking”) as it is usually referred, involves drilling several thousand feet into the ground and using a mixture of water, sand and proppant to fracture the surrounding rock formation. Hydraulic fracturing is typically used for horizontal drilling, in which the drilling direction is changed from vertical to horizontal, extending deep within the shale. The purpose of horizontal drilling is to gain access to as much of the shale formation as possible, without having to drill dozens or hundreds of individual vertical wells that will not extend far beyond the end of the vertical drill. Once the driller has reached the desired horizontal distance of drilling, the shale formation is fractured using a large and highly pressurized volume of the fracing fluid. The proppant chemicals in the fracing fluid are designed to hold the fractures in the shale open, releasing the natural gas that is trapped within the shale. This released gas can then be harvested and recovered for commercial use.

Hydraulic Fracturing Chemicals

A major concern facing Pennsylvanians is the chemical composition of the fracturing fluid. So far the Commonwealth has been given a list of approximately 60 different chemical compounds that make up fracturing fluid, but not their concentrations. Also, it is unclear whether all of the chemical identities have been fully disclosed. Some of the chemicals are common household items – guar gum (a common food thickener), sucrose (sugar), or sodium chloride (table salt) – but some items are dangerously toxic. The table below lists some of those chemicals and the hazards associated with exposure to these substances. It is stressed that without knowing the specific concentrations of each chemical in fracturing fluid, the level of harm from exposure cannot be predicted. Additionally, different fracturing chemicals contain different formulas and different concentrations.

Methyl Alcohol	Very poisonous – may cause blindness or death if swallowed. Will de-fat the skin, causing it to become dry and cracked upon contact. Inhalation produces toxic effects on nervous system. Symptoms of overexposure include headache, drowsiness, nausea, vomiting, blurred vision, blindness, coma, and death. ⁱ
Hydrochloric Acid	Poisonous, corrosive – liquid and mist can cause burns to body tissue. May be fatal if swallowed or inhaled. Inhalation can cause coughing, choking, and in severe cases, pulmonary edema, circulatory failure, and death. Permanent eye damage, severe skin burns, and erosion of teeth can occur with exposure. ⁱⁱ
Boric Acid	Normally found in roach-killing products – symptoms include blue-green vomit, diarrhea, and a bright red rash. Other symptoms include blisters, collapse, coma, convulsions, drowsiness, fever, low blood pressure, sloughing of skin, and twitching of muscles. ⁱⁱⁱ
Monoethanolamine	Severe eye and lung irritant – may produce tissue damage on mucous membranes of eyes, mouth, and respiratory tract. Corrosive on skin. Other symptoms of inhalation include coughing, choking, or shortness of breath. Eyes may experience redness, watering, and itching. ^{iv}
Potassium Hydroxide	Very poisonous. May cause severe burns to skin, eyes, respiratory tract, and gastrointestinal tract. Extremely destructive to all body tissues and may be fatal if swallowed. Blindness may result from eye contact. ^v
Propargyl Alcohol	Severely corrosive and irritable to eyes, skin, and respiratory tract. Liquid or spray mist may produce tissue damage to mucous membranes of eyes, mouth, and respiratory tract. Other symptoms include coughing, choking, shortness of breath. Skin contact produces itching, scaling, reddening, or blistering. Eye contact produces redness, watering, and itching. Severe exposure may result in death. ^{vi}
Acetic Anhydride	Exposure in either liquid or vapor form causes severe irritation of the eyes, skin, and mucous membranes. The vapor can be irritating even in concentrations as low as 0.09 ppm, with people exposed to concentrations higher than 5 ppm experiencing acute eye and upper respiratory tract irritation. Symptoms included severe eye pain and difficult breathing. Delayed burns that are slow to heal may occur. Damage to the iris and blindness may also occur. ^{vii}

There are dozens of other chemicals in the frac fluids, including benzene and other known carcinogens and volatile organic compounds.

Advocates for the oil and gas industry assert that these chemicals are present in such small amounts that they pose little threat to either their workers or the general public. That assertion is misleading.

A typical frac job can use as much as 4 million gallons of frac solution. The industry is quick to assert that 99.5 percent of frac fluid is water and sand. Even so, the numbers are still staggering. If just one percent of the total frac fluid used in a job is spilled, that equals 40,000 gallons of frac fluid. If just half of one percent of that fluid contains dangerous chemicals, that would still amount to 200 gallons of toxic chemicals.



Source: Abrahm Lustgarten / ProPublica

Toxic spills have already occurred. In less than one week's time span in September 2009, Cabot Oil & Gas had three spills, dumping approximately 8,000 gallons of frac water and chemicals. The spill, which occurred in Dimock Township, Susquehanna County, resulted in polluted wetlands and a fish kill in Stevens Creek.^{viii} The company was fined a paltry \$56,650 and ordered to suspend all hydraulic fracturing operations in Susquehanna County until the company submitted an updated plan and an engineering study on October 6.^{ix}

As demonstrated in Dimock Township, it does not take very much frac fluid being spilled to have devastating effects on the environment.

Without knowing the exact chemical composition of frac fluid, the public can only speculate as to the toxicity of the chemical solution. Therefore, it is of utmost importance to know exactly what is being used. New York's Department of Environmental Conservation has issued draft regulations that require full disclosure of chemical concentrations in fracturing fluid, and Rep. George has introduced legislation that will do the same.

WATER ISSUES

Of the 4 million gallons of fracturing fluid used for hydraulic fracturing, up to 70 percent of the fluid may flow back to the surface, though the typical range is 0 to 30 percent. The rest of the fluid (or sometimes, all of the fluid) remains deep underground. The Marcellus Shale formation is thousands of feet underground, below any underwater aquifers connected to our drinking water supply, but a risk, however small, does exist that undetected natural fractures in the geologic formation may allow frac fluid to flow to untraceable places, including an underwater aquifer. The greater risk to underground drinking water supplies, however, is due to improper casing during the drilling process, which may allow frac fluid to leak before it ever reaches the Marcellus Shale formation deep underground. Rep. George has legislation to prevent this, through mandatory inspections of well sites during all phases of the drilling process.



Rep. George examines a stream with a young citizen

Surface mismanagement remains a high concern as a risk to surface water supplies. Frac fluid that flows back to the surface and is stored in pits is not only a risk to the air quality, fully discussed later in this report, but also to water supplies. Pits used for frac fluid storage are lined (sometimes double-

lined), but these liners may still leak, and leaks are hard to detect. Further risk to water supplies occurs when rain or snowfall causes an overflow from these pits, spilling quantities of frac fluid into our environment.

TOTAL DISSOLVED SOLIDS (TDS) IN THE MON

Water that is returned to the surface after fracing must first be treated before it can be put back into our streams and rivers. Many companies are simply paying municipal wastewater treatment facilities to take on this frac water. These facilities may be happy to take on the extra capacity for a profit, but the majority of these facilities are not adequately equipped to remove the harsh chemicals that are not normally found in municipal wastewater. Consequently, even after treatment, the water being released out of the plant can still contain high levels of foreign and toxic substances not normally present in our watersheds. In addition to the chemicals found in fracing fluid, water flowing back to the surface also contains high levels of salts and chlorides that are naturally found deep underground in the shale formation. These salts and chlorides are collectively known as Total Dissolved Solids (TDS) and produce a brackish solution of brine water.

In October 2008, along 70 miles of the Monongahela River, which provides drinking water to 350,000 people, an unusually high level of TDS was detected in the water. TDS may include metals, salts, and other elements. Levels of TDS were detected at up to 852 mg per liter, with 500 mg per liter being the state and federal standard for Secondary Maximum Contaminant Level. TDS is referred to as a secondary contaminant because it affects the taste and odor of water, but is not considered threatening to human health in the same manner that primary contaminants are.^x

Several sources were speculated to be the cause, with some of the blame focused on wastewater illegally dumped into the river from oil and gas drilling activities, as well as from acid mine discharges. The TDS levels have since gone down, back below federal and state excess levels. On November 7, 2009, the Environmental Quality Board proposed new regulations that will create stricter standards for wastewater discharges containing high levels of TDS.^{xi}

TWO WORDS: DUNKARD CREEK

While the Cabot Oil & Gas Company's spill in Susquehanna County was a major problem, perhaps the single biggest Pennsylvania environmental disaster of 2009 may be the absolute annihilation of aquatic life in Dunkard Creek, Greene County.

In early September, the 38-mile Dunkard Creek suffered a complete fish kill – 161 aquatic species died in the creek, including fish, mussels, salamanders, crayfish, and aquatic insects. Preliminary counts put the fish kill number as high as 10,000. This includes 18 species of fish and 16 species of freshwater mussels.^{xii}



Source: West Virginia Dept. of Environmental Protection

Initial reports stated that the pollution in the water may have been coming from discharges from a mine water treatment facility at Consol Energy's Blacksville No. 2 mine in West Virginia. Water sampling found that the stream had extremely high levels of TDS and chlorides, substances not generally present in such high concentrations. Some speculated towards unauthorized dumping of gas drilling wastewater into the creek as a cause for the high levels of TDS, but reports by the Department of Environmental Protection (DEP) and the United States Environmental Protection

Agency (EPA) did not substantiate those claims. Levels of TDS reported through testing were in the 25,000-35,000 mg per liter range, far above the 500 mg per liter standard.^{xiii}

After testing a dozen streams and the Monongahela River for golden algae, DEP and EPA stated that they believed golden algae was the cause of the massive fish kill. Golden algae thrive in salty, brackish water, the same type created by high concentrations of TDS in streams and rivers. Normally found in coastal waters, this was the first time that golden algae had been discovered in mid-Atlantic states. The introduction of this invasive species has led investigators to believe that the algae may be the cause for the environmental destruction in Dunkard Creek.^{xiv}



Source: <http://www.observer-reporter.com/>

Consol Energy's Blacksville No. 2 mine is believed to be the primary source of the high levels of TDS in this case, but it should be noted that natural gas drilling wastewater does contain high levels of TDS, and no matter the source, if golden algae are present in water with high levels of TDS, the algae may thrive and result in a fish kill.

Many have been wondering how the golden algae came to be found in Dunkard Creek, and signs point to the possibility of the algae migrating here on drilling equipment used in Texas for gas drilling activities. DEP does have standards in place to decontaminate out-of-state equipment, but as the Dunkard Creek incident indicates, we can never be fully immune from the introduction of a foreign substance or an invasive species into our environment. The high level of TDS in the creek simply provided a well-suited habitat for the golden algae. Although the high level of TDS in the creek in this instance came from a mine, we must be sure that our natural gas drilling wastewater is properly treated to prevent the creation of more possible habitats for the golden algae.

ROAD DEGRADATION

One of the issues having the most immediate impact to the public is the degradation of local roads that occurs each time a frac job must be done. Because most of the Marcellus Shale deposit in Pennsylvania spans across large sections of rural land, many of the roads used by trucks to haul water to the drilling sites are small, local roads that are not built for heavy machinery or trucks. Water is transported to the drilling sites using large tanker trucks – the kind we often see hauling gasoline on our highways. A large tanker truck can hold between 5,000 and 9,000 gallons of water,^{xv} which can weigh from 40,000 to 75,000 pounds. A frac job for a horizontal well could use up to 4 million gallons of water, which will require 445 to 800 tanker truck trips, which occur 24 hours a day for several days or weeks at a time with the attendant road degradation, dust pollution, and the constant noise of trucks hauling water. Meanwhile, local citizens are left to pay the taxes necessary for road repairs while they put up with the noise and dust.

AIR QUALITY ISSUES

Because Marcellus Shale gas extraction is still in its infancy, there is little data available to examine the effects of large-scale natural gas drilling on surrounding air quality. However, numerous studies have been completed on the effects of natural gas extraction in the Barnett Shale region in Texas. Barnett Shale gas extraction has already expanded rapidly, and as of March 3, 2009, there were a total of 10,539 gas wells and 5,037 permitted wells in the Shale field.^{xvi} In comparing the two geologic formations, Barnett Shale covers approximately 5,000 square miles,^{xvii} while Marcellus Shale covers approximately 54,000 square miles.^{xviii} The potential for drilling in Marcellus Shale far exceeds

that of Barnett Shale, and this should be taken into account when the air quality studies in the Barnett Shale are examined. By sheer size difference alone, the speculative emissions from Marcellus drilling could dwarf the measured emissions from Barnett within a decade.

A study conducted in the Barnett Shale area divided emissions sources from the oil and gas sector into several point sources, including compressor engine exhausts and oil/condensate tanks, fugitive and intermittent sources, including production equipment fugitives, well drilling, and fracing engines, well completions, gas processing, and transmission fugitives. The pollutants fell into several categories, including greenhouse gases, air toxic chemicals, and smog-forming compounds, such as nitrogen oxide (NO_x) and volatile organic compounds (VOC).

Based on the study, emissions of smog-forming compounds for 2009 from all oil and gas sources were estimated at 191 tons per day (tpd) on an annual average, with peak summer emissions at 307 tpd. Of those total emissions during the summer, 165 tpd came from the 5-counties in the Dallas-Fort Worth metropolitan area that have significant oil and gas production.

In comparison, state and federal regulators estimated emission inventories for 2009 from all airports in the Dallas-Fort Worth area to be 16 tpd, and the emission estimates for the 9-county Dallas-Fort Worth metropolitan area for on-road motor vehicles was 273 tpd. In the five counties of that area with significant oil and gas production, the total on-road vehicle emissions was 121 tpd, meaning that the oil and gas sector was providing greater emissions than cars and trucks in those counties.

Air toxic compounds, including benzene and formaldehyde, were predicted at 6 tpd on average, with 17 tpd during summer months, and greenhouse gases like carbon dioxide and methane were predicted at 33,000 tpd of CO₂ equivalent, as much as two 750 MW coal-fired power plants.^{xix}

Although the high emissions in the Dallas-Fort Worth metropolitan area in part come from a large number of vehicles and other smog- and greenhouse-producing gases in the area, it should be noted that beginning in 2002, the rural Denton County air testing site has maintained the highest concentrations of total non-methane organic carbon concentrations every year.^{xx}

A study conducted in the town of DISH, Texas (located in Denton County) tested for volatile organic compounds, hazardous air pollutants, and Tentatively Identified Compounds on multiple locations. The results confirmed the presence of multiple "Recognized and Suspected Human Carcinogens in fugitive air emissions" at several locations throughout the town. As the study states, the chemicals identified are known ingredients used within natural gas industrial processes, such as exploration, drilling, flaring, and compression. Laboratory results confirmed levels of toxins in excess of the Texas Commission on Environmental Quality's Short Term and Long Term Effects Screening Levels. Several locations confirmed high levels of a chemical that is categorized with the capability for "disaster potential."^{xxi}

As numerous studies have already confirmed, drilling activity in the Barnett Shale has increased the emissions levels of several known carcinogens, volatile organic compounds, greenhouse gases, and smog-producing components. Various practices involved with hydraulic fracturing, as well as emissions from the machinery used, have been the source for rapid degradation of air quality in areas where gas drilling is occurring.

The State of the Air 2009 report, issued by the American Lung Association, lists the Dallas-Fort Worth, Texas area as the 7th most ozone-polluted city in the nation. Further, Dallas County is listed as the 19th most ozone-polluted county. Rural Denton County is listed as 22nd.^{xxii}

The documented history of what has happened in Texas recently is a prophecy of what can happen in Pennsylvania without proper regulations and air quality standards in place to ensure that drilling

activities are monitored and controlled, and open pits for storing used fracking fluid (allowing chemicals, including volatile organic compounds, to evaporate into the air) are restricted, or even banned.



Source: <http://www.un-naturalgas.org/>

It is unknown what will happen to the air quality in Pennsylvania if open pits such as these are allowed to continue, releasing evaporated chemicals into the air from used hydraulic fracturing fluid. Machinery and other gas drilling activities add to the problem.



Sources: J. Henry Fair / <http://www.industrialcars.com/>, Light Hawk, & Catskill Mountainkeeper

OIL & GAS INDUSTRY – FEDERAL ENVIRONMENTAL LAW EXEMPTIONS

An October 2007 study by the Oil & Gas Accountability Project highlights several of the exemptions to federal environmental laws that allow the oil and gas industry to operate without meeting certain standards that other industries must comply with. The following list contains current federal statutes that contain provisions that the oil and gas industry enjoys certain exemptions from:

Clean Air Act

Clean Water Act

Safe Drinking Water Act

National Environmental Policy Act

Resource Conservation and Recovery Act

Comprehensive Environmental Response, Compensation, and Liability Act

Toxic Release Inventory under the Emergency Planning and Community Right-to-Know Act^{xxiii}

There is pending legislation in Congress, called the Fracturing Responsibility and Awareness of Chemicals (FRAC) Act, that would remove the exemption under the Safe Drinking Water Act, but the oil and gas industry remains excused from meeting many of the standards that most other industries must comply with.

PA SURFACE OWNERS' PROTECTION RIGHTS

Current law in Pennsylvania does provide some protection to surface owners, but more protection is needed. Gas companies seeking land for natural gas storage must attempt to reach an agreement with the surface owner regarding payment for surface damages before any storage activity can take place. If no agreement is reached, a surety bond must be posted. If the surface owner does not believe the bond is sufficient, the owner may petition the court, who may appoint viewers to assess the damages to arrive at reasonable compensation for the owner. These individuals must be disinterested freeholders of the county, and after filing a report with the court, the court will issue reasonable compensation to the viewers.

After the bond is approved, the company shall then have the right to conduct activities, which may include storing gas, entering property in order to locate, recondition, maintain, plug, or otherwise operate active or abandoned wells within the storage reservoir boundary or reservoir protective area.^{xxiv}

House Bill 1155 would create the Surface Owners' Protection Act. This legislation requires compensation to surface owners for damages resulting from diminished property value as a result of drilling, as well as a mandate for drillers to reclaim any land affected by oil or gas drilling within nine months of termination of activities. Several other provisions exist in the legislation to further protect surface owners against land and water degradation on their property.

HOUSE BILL 1489: SEVERANCE TAX

Of the natural gas producing states, most have a severance tax to deal with most of the issues mentioned in this report. Pennsylvania, to date, has yet to enact such legislation. Although the House of Representatives passed a measure for a severance tax in 2009, the Senate blocked the measure. The debate continues on over whether or not a severance tax is right for Pennsylvania, but it is important to consider the following points:

Gas producers claim that a severance tax would hurt a fledgling industry that is still in its infancy, but the two top drillers in Pennsylvania have been in business since the 1960s and 1970s, and alone account for 67 percent of the growth in the Marcellus Shale drilling.

Most natural gas drillers in Pennsylvania do not pay the 9.99 percent Corporate Net Income Tax. Rather, 70 percent of these companies operate as Limited Liability Corporations that are subject to only the 3.07 percent Personal Income Tax – major corporations that pay only the same tax rate as the citizens of the Commonwealth, while most pay no Corporate Net Income Tax at all.

Fines for spills and bonding requirements for wells often do not cover the excessive costs associated with cleaning up spills and reclaiming areas that have been damaged as a result of natural gas drilling. A severance tax will place money back in the hands of local governments to help them repair and reclaim these areas.

House Bill 1489, in its current form, would levy a 5 percent tax on the price of natural gas at the wellhead, plus an additional 4.7 cents per thousand cubic feet extracted from the ground. This tax rate is the same as West Virginia's, and drilling has not been disrupted in the Marcellus Shale formation in that state.

The money raised through a natural gas severance tax will be allocated in the following manner:

- 60% to the General Fund
- 15% to the Environmental Stewardship Fund
- 5% to the Liquid Fuels Tax Fund
- 4.5% to counties where natural gas is severed
- 4.5% to municipalities where natural gas is severed
- 4% to the Hazardous Sites Cleanup Fund
- 3% to the Department of Welfare for LIHEAP assistance
- 2% to the Pennsylvania Game Commission
- 2% to the Pennsylvania Fish and Boat Commission

The money from a severance tax will ensure that the costs to the environment and our infrastructure are borne by the drillers and not by the taxpayers who otherwise would have to pay to repair the local infrastructure damages and environmental degradation associated with increased gas drilling.

HOUSE BILLS 2213 & 2214

Rep. George introduced House Bill 2213, which will strengthen several of our environmental laws regarding natural gas drilling. Highlights of the bill include the following:

- Full disclosure of the chemicals used in hydraulic fracturing, including specific concentrations (this information will be posted in DEP's website for public view)
- DEP will be required to inspect the well site during each phase of drilling
- The scope of rebuttable presumption concerning pollution of a water supply within 1,000 feet of an oil or gas well is extended to 2,500 feet and is expanded to include a diminution of the nearby water supply
- Outdated well plugging bond amounts are updated to cover the actual cost of service
- Clarification of local governments' zoning power to regulate the time and place of oil and gas activities

Additionally, House Bill 2214 increases the minimum royalty amounts to be paid to lessors who lease land to oil and gas drillers from 12.5 percent to 15 percent, and post-production costs may not decrease the royalty payment owed to a landowner.

A LEGACY OF MISSED OPPORTUNITIES

Pennsylvania citizens know all too well the legacy costs associated with failure to act when the time is right. Many citizens who live in the coal regions are familiar with orange or rust discoloration in local streams that is a result of acid mine drainage, a problem that DEP has spent decades and countless resources attempting to fix. Had this state enacted measures early on to tackle this problem, perhaps our citizens would not be dealing with the costs and pollution that plague us today as a result of careless coal mining.



Source: <http://www.hazlett-kincaid.com/>

State lands are being leased for natural gas drilling. Private landowners are also taking advantage of the money to be made by leasing their land to gas drillers. While this represents a great opportunity, we must ensure that our lakes, streams, ponds, and game lands are preserved, so that generations ahead may use them to hike, fish, hunt, or simply to enjoy nature. It is through education and action that we can take advantage of the Marcellus Shale that exists under the Commonwealth, without compromising the quality of our environment.

The right to a clean environment is not simply a talking point or political tool – it is a guarantee provided in the Commonwealth's Constitution. Article I, Section 27 provides for the following:

“The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people.”^{xxv}



WHAT YOU CAN DO

CONTACT YOUR LEGISLATORS

To find your State Representative and State Senator, visit <http://www.legis.state.pa.us/> and send them an email or write, voicing your concerns. We are here to serve the people of Pennsylvania.

Visit <http://www.house.gov/> or <http://www.senate.gov/> to contact your federal Representative or Senator.

Tell your state legislators to support House Bill 1155, the Surface Owners' Protection Act, which will provide for better accountability on the part of oil and gas drillers to compensate landowners for damages and mandate reclamation of disturbed lands, as well as House Bill 1489, the Natural Gas Severance Tax Act, which will provide funding for cleanup of hazardous spills, land reclamation, and road repairs, among other projects. House Bills 2213 and 2214 will further protect the Commonwealth's water and land and guarantee those leasing land will receive fair royalty payments.

Contact your members of Congress and tell them to support the Fracturing Responsibility and Awareness of Chemicals Act, H.R. 2766 and S. 1215 in the House and Senate, respectively. The FRAC Act will amend the federal Safe Drinking Water Act to: "(1) repeal the exemption from restrictions on underground injection of fluids near drinking water sources granted to hydraulic fracturing operations under such Act; and (2) require oil and gas companies to disclose the chemicals used in hydraulic fracturing operations," according to a summary produced by the nonpartisan Congressional Research Service.^{xxvi}

KNOW YOUR RIGHTS

If a gas company contacts you to lease your land for drilling, do your homework! Read the entire lease to be sure you are aware of all stipulations and be aware of what you are entitled to in terms of royalties and compensation for water or land damage. Consult an attorney.

STAY INFORMED

Read up on the latest news online, follow local newspapers for meetings held by county or municipal officials, and come prepared with questions. Knowledge is power and we have a responsibility to keep ourselves informed as to what is occurring in our own backyards.

NATURAL GAS HAS ITS BENEFITS AND ITS DRAWBACKS. AN INFORMED CITIZEN IS AN EMPOWERED CITIZEN.

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MARCELLUS SHALE & HYDRAULIC FRACTURING – WHAT YOU NEED TO KNOW

A REPORT BY STATE REPRESENTATIVE CAMILLE “BUD” GEORGE, CHAIRMAN
HOUSE ENVIRONMENTAL RESOURCES & ENERGY COMMITTEE

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PENNSYLVANIA HOUSE OF REPRESENTATIVES
ENVIRONMENTAL RESOURCES & ENERGY COMMITTEE

Room 38B East Wing, P.O. Box 202074

Harrisburg, PA 17120-2074

(717) 787-7316

<http://www.pahouse.com/george/>

