



JONES DAY
COMMENTARY

NATURAL GAS PRODUCTION IN PENNSYLVANIA'S PORTION OF THE MARCELLUS SHALE AND THE CHALLENGES THAT MAY LIE AHEAD

The Marcellus Shale underlies six states, but geographically Pennsylvania has the largest portion. While often found at depths of several thousand feet, the Marcellus Shale contains natural gas that can be cost-effectively produced using horizontal drilling and hydraulic fracturing. The number of Marcellus Shale wells in Pennsylvania has increased significantly. In 2009, 768 Marcellus Shale wells were drilled in Pennsylvania, up from 195 in 2008.¹ By November 30, 2010, 1,368 Marcellus Shale wells had been drilled, and 2,916 drilling permits had been issued.²

According to November 1, 2010 Pennsylvania Department of Environmental Protection (“DEP”) production reports, Pennsylvania Marcellus Shale drilling produced almost 195 billion cubic feet—194,558,961.59 Mcf—of natural gas from July 2009 through June 2010.³ A study conducted by Penn State University predicts that by 2015, Pennsylvania’s production could reach an estimated seven billion cubic feet per day.⁴ The potential economic boom for Pennsylvania cannot be overstated. Marcellus Shale drilling created an estimated 44,000 jobs in Pennsylvania in 2009, was

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- 1 Pa. Dep’t of Env’tl. Prot., 2009 Permits Issued and Wells Drilled Map, available at <http://www.dep.state.pa.us/dep/deputate/minres/oilgas/2009PermitDrilledmaps.htm> (all web site herein last visited Feb. 15, 2011).
 - 2 Pa. Dep’t of Env’tl. Prot., 2010 Permits Issued and Wells Drilled Map, available at <http://www.dep.state.pa.us/dep/deputate/minres/oilgas/photogallery/photo13295/MarcellusWells%20permitted-drilled%20January-November%202010.gif>.
 - 3 Pennsylvania Oil & Gas Well Statewide Production Report by Reporting Period, Pa. Dep’t of Env’tl. Prot., at 273, available at <https://www.paoilandgasreporting.state.pa.us/publicreports/Modules/DataExports/DataExports.aspx> (click “PDF” for 2010).
 - 4 Timothy J. Considine, Robert Watson, & Seth Blumsack, “The Economic Impacts of the Pennsylvania Marcellus Shale Natural Gas Play: An Update” (May 24, 2010), at 17, available at <http://marcelluscoalition.org/wp-content/uploads/2010/05/PA-Marcellus-Updated-Economic-Impacts-5.24.10.3.pdf>.

projected to create more than 88,000 jobs in 2010, and is projected to create more than 111,000 jobs in 2011.⁵

Increased drilling and development, however, comes with enhanced scrutiny by interested constituencies, including the public and government regulators, such as DEP, the Pennsylvania Environmental Quality Board (“EQB”), and the U.S. Environmental Protection Agency (“EPA”). The level of scrutiny has increased of late in part because of events that have raised concerns about the safety of natural gas drilling operations. For example, shale drilling has been identified as the possible cause of several instances of high levels of total dissolved solids (“TDS”) in the Monongahela River over the past two years.⁶ In 2009, high TDS levels, possibly from shale drilling operations, allegedly killed all fish and aquatic life along a 30-mile stretch of Dunkard Creek in Greene County, Pennsylvania.⁷ Regulatory agencies in Pennsylvania, West Virginia, and New York are all grappling with understanding the potential impact of hydraulic fracturing operations on TDS in the streams and rivers.⁸

In early 2009, DEP fielded several complaints concerning methane contamination of water near natural gas drilling sites in northern and northeastern Pennsylvania, and, on September 23, 2009, it cited a company for allowing natural gas to seep out of well structures and into groundwater.⁹ A pair of drilling accidents in June 2010 in Clearfield County, Pennsylvania and Moundsville, West Virginia generated significant publicity, particularly since the Clearfield County incident resulted in the release of natural gas and wastewater into the environment.¹⁰ These events have increased the attention already being paid to the energy industry in general, and the natural gas industry in particular, by federal and state authorities and the environmental community.

FEDERAL DEVELOPMENTS

Enforcement. In February 2010, EPA announced its National Enforcement Initiatives for the years 2011 through 2013. EPA sets such enforcement initiatives every three years to address pollution problems EPA finds particularly complex, often focusing on problems unique to a specific sector or type of source. All of the initiatives identified were carryovers from EPA’s 2008–2010 National Enforcement Initiatives list, except one. EPA added a new initiative focused on ensuring that the energy industry complies with environmental laws. In announcing the initiative, EPA explained that “[s]ome energy extraction activities, such as new techniques for oil and gas extraction and coal mining pose a risk of pollution of air, surface waters and ground waters if not properly controlled.”¹¹

As part of this initiative, EPA has announced that it will engage in targeted enforcement of the Clean Air Act, Clean Water Act, and Safe Drinking Water Act in the energy industry. EPA also has advised its regional offices that the Oil Pollution Act, Spill Prevention, Control and Countermeasure Plans, Underground Injection Control Programs, and the Resource Conservation and Recovery Act are available enforcement mechanisms. According to EPA, natural gas production may have negative impacts on air quality, including the emission of air toxics such as benzene and other pollutants.

EPA also has expressed two water quality concerns regarding the shale drilling industry’s use of hydraulic fracturing to extract natural gas from shale formations. First, EPA is concerned about the large amount of water needed for fracturing operations. It is not uncommon for a single Marcellus Shale well to utilize millions of gallons of water. These large

5 *Id.* at 18-19.

6 Don Hopey, “Toxins Tied to Fish Kill May Have Hitchhiked,” *Pittsburgh Post Gazette*, Oct. 4, 2009, available at <http://www.post-gazette.com/pg/09277/1003007-113.stm>.

7 *Id.*

8 Marc Levy & Vicki Smith, “Appalachia Gas Drilling Infects Drinking Water, Kills Fish,” *The Huffington Post*, Feb. 2, 2010, available at http://www.huffingtonpost.com/2010/02/02/appalachia-gas-drilling-i_n_446382.html.

9 Press Release, Pa. Dep’t of Env’tl. Prot., DEP Issues Violation Notice to Cabot Oil & Gas (Sept. 23, 2009), available at http://www.portal.state.pa.us/portal/server.pt/community/search_articles/14292 (search “Begin Search” and “End Search” for “09/23/2009”).

10 Don Hopey, “Hearings to Spotlight Safety Issues at Gas Wells,” *Pittsburgh Post-Gazette*, July 26, 2010, available at <http://www.post-gazette.com/pg/10207/1075355-455.stm>.

11 U.S. Env’tl. Prot. Agency, National Enforcement Initiatives for Fiscal Years 2011–2013, available at <http://www.epa.gov/oecaerth/data/planning/initiatives/initiatives.html>.

withdrawals of surface water or groundwater may have significant ecological consequences on local habitats. Second, EPA is concerned with the storage, treatment, and disposal of the wastewater (also known as frack water or brine) generated during the hydraulic fracturing process. Frack water may contain high levels of chlorides (salt), sulfates, and other pollutants. As a result, wastewater treatment plants accepting frack water may exceed their permit limits for TDS.

EPA already has initiated enforcement actions concerning hydraulic fracturing in other shale formations. For example, a homeowner near the Newark East (Barnett Shale) field in Texas complained to the EPA in late August 2010 about a private drinking water well, alleging that the tap water was flammable and bubbling. EPA launched an investigation, finding high levels of methane and other contaminants, including benzene, in the drinking water. After analyzing water and gas samples, EPA “determined that natural gas drilling near the homes by Range Resources in Parker County, Texas, has caused or contributed to the contamination.”¹²

On December 7, 2010, EPA issued an imminent and substantial endangerment order to Range Resources Corporation and Range Production Company pursuant to Section 1431 of the Safe Drinking Water Act (the “Order”). The Order requires Range Resources to: (1) “[i]mmediately deliver potable water to ... two residences”; (2) “[i]mmediately sample soil gas around the residences”; (3) “[i]mmediately sample all nearby drinking water wells to determine the extent of aquifer contamination”; (4) “provide methane gas monitors to alert homeowners of dangerous conditions in their houses”; (5) “develop a plan to remediate areas of the aquifer that have been contaminated”; and (6) “investigate the structural integrity of its nearby natural gas well to determine if it is the source of the contamination.”¹³

On January 18, 2011, EPA sued Range Resources Corporation and Range Production Company alleging that the companies’ operations contaminated drinking water wells in violation of the Safe Drinking Water Act and seeking an injunction ordering the companies to comply with the Order.¹⁴ Range Resources maintains that its activities have no impact on the at-issue wells; its wells are completed more than a mile below the water zone, and, according to its investigation, the “methane in the water aquifer existed long before [its] activity and likely is naturally occurring migration from several shallow gas zones immediately below the water aquifer.”¹⁵

Similar enforcement actions could occur in Pennsylvania, particularly because EPA Region III, the regional office responsible for the execution of EPA’s programs within Pennsylvania, recently created a task force to impose strict standards on fossil fuel extraction.¹⁶ The task force will take a holistic approach to analyzing all environmental impacts from different energy extraction industries, including the natural gas industry. This will include tracking TDS in wastewater from drilling sites, treatment of the wastewater at publicly owned treatment works, and potential impacts to drinking water. The task force plans to work with federal, state, and local agencies to engage in targeted enforcement actions.

Studies and Potential Legislation and Regulation. In March 2010, EPA launched a comprehensive study of the environmental ramifications of hydraulic fracturing. In its press release, EPA explained that there are “concerns that hydraulic fracturing may impact ground water and surface water quality in ways that threaten human health and the environment.”¹⁷ In September 2010, EPA requested information from nine natural gas service companies regarding their hydraulic fracturing practices. EPA sought to determine the impact of hydraulic fracturing on drinking water and the public health

12 Press Release, U.S. Env’tl. Prot. Agency, EPA Issues an Imminent and Substantial Endangerment Order to Protect Drinking Water in Southern Parker County (Dec. 7, 2010), available at <http://yosemite.epa.gov/opa/admpress.nsf/0/713F73B4BDCEB126852577F3002CB6FB>.

13 *Id.*

14 *Id.*

15 News Release, Range Responds to EPA Allegations (Dec. 8, 2010), available at <http://www.businesswire.com/news/home/20101208005660/en/Range-Responds-EPA-Allegations>.

16 *Region III Task Force to Seek Enforcement, Stronger State Drilling Rules*, Inside the EPA, Aug. 20, 2010.

17 Press Release, U.S. Env’tl. Prot. Agency, EPA Initiates Hydraulic Fracturing Study: Agency Seeks Input from Science Advisory Board (Mar. 18, 2010), available at <http://yosemite.epa.gov/opa/admpress.nsf/e77fd4f5afd88a3852576b3005a604f/ba591ee790c58d30852576ea004ee3ad10penDocument>.

by learning “the chemical composition of fluids used in the hydraulic fracturing process, data on the impacts of the chemicals on human health and the environment, standard operating procedures at hydraulic fracturing sites and the locations of sites where fracturing has been conducted.”¹⁸ Eight of the nine companies agreed to voluntarily submit the information requested concerning their hydraulic fracturing practices; EPA subpoenaed the last company for the requested information in November 2010.¹⁹ EPA’s deadline to release the initial results of its study is the end of 2012.

Congress, too, is examining hydraulic fracturing. Currently, hydraulic fracturing is exempt from Safe Drinking Water Act requirements. Senator Robert Casey of Pennsylvania and Representative Diana DeGette of Colorado have submitted bills in the House and the Senate attempting to abolish this exemption.²⁰

In February and early May 2010, the House Committee on Energy and Commerce sent document requests—separate from the EPA’s September 2010 document requests—to several energy companies. The purpose of the Committee’s investigation is to determine whether federal regulation of hydraulic fracturing operations is needed to safeguard drinking water supplies. The Committee requested documents regarding: (1) the number of wells engaged in hydraulic fracturing, particularly any fracking occurring near underground drinking water sources, and specifically wells fracking to produce (a) shale gas, (b) coalbed methane, and (c) tight sandstone gas; (2) the identity and volume of chemicals used in fracking; (3) the environmental or health effects of chemicals used in fracking; (4) allegations against

the companies regarding harm to human health or the environment; and (5) owners of hydraulically fractured wells. The responding companies stated that they were unable to provide information regarding “the proximity of specific wells to underground sources of drinking water, or ... the recovery and disposal of fluids and water that flow back to the surface of wells.”²¹

In response, in July 2010, the Committee requested this information from 10 well operators who had hired at least one well service company to perform hydraulic fracturing at their sites. The Committee released its report on January 31, 2011. Among other things, the Committee found that more than 32 million gallons of diesel fuel were used in hydraulic fracturing fluids during a five-year period in 19 states.²² The report further states that such use of diesel fuel in hydraulic fracturing fluids could constitute a violation of the Safe Drinking Water Act.²³ Members of the Committee shared the report findings with EPA. In response, EPA stated that it has embarked on “an expeditious effort” to clarify the permitting process under the Safe Drinking Water Act’s underground injection control program as it relates to diesel fuel use in hydraulic fracturing operations.²⁴

The natural gas industry has disputed the Committee report’s factual and legal findings.²⁵ Industry representatives argue that, while EPA may have the authority to regulate the use of diesel in fracturing fluid, EPA did not have any rules on the issue until 2010. Since there were no rules to violate, the industry claims that it could not have violated the law. The rules that were imposed in 2010 are currently being litigated as well since industry argues that EPA imposed the

18 Press Release, U.S. Env’t. Prot. Agency, EPA Formally Requests Information from Companies About Chemicals Used in Natural Gas Extraction: Information on Hydraulic Fracturing Chemicals Is Key to Agency Study of Potential Impacts on Drinking Water (Sept. 9, 2010), available at <http://yosemite.epa.gov/opa/admpress.nsf/0/EC57125B66353B7E85257799005C1D64>.

19 Press Release, U.S. Env’t. Prot. Agency, Eight of Nine U.S. Companies Agree to Work with EPA Regarding Chemicals Used in Natural Gas Extraction: EPA Conducting Congressionally Mandated Study to Examine the Impact of Hydraulic Fracturing Process on Drinking Water Quality (Nov. 9, 2010), available at <http://yosemite.epa.gov/opa/admpress.nsf/0/A96496444C546959852577D6005E63D6>.

20 S. 1215, 111th Cong. (2009); H.R. 2766, 111th Cong. (2009).

21 *Committee Requests More Details on Hydraulic Fracturing Practices*, Committee on Energy and Commerce, July 19, 2010, available at <http://democrats.energycommerce.house.gov/index.php?q=news/committee-requests-more-details-on-hydraulic-fracturing-practices>.

22 Amena Saiyid, “Probe Finds Use of Diesel Fracking Fluid Could Be in Violation of Drinking Water Act,” *BNA Daily Env’t Rep.*, Feb. 1, 2011, available at http://news.bna.com/deln/DELNWB/split__display.adp?fedfid=19459363&vname=dennotalissues&fn=19459363&jd=a0c6e8f1r5&split=0.

23 *Id.*

24 *Id.*

25 Abrahm Lustgarten, “Drilling Industry Says Diesel Use Was Legal,” *Pro Publica*, Feb. 2, 2011, available at <http://www.propublica.org/article/drilling-industry-says-diesel-use-was-legal>.

rules without using the rulemaking process required by the Administrative Procedures Act.²⁶

The Department of the Interior's Bureau of Land Management ("BLM")—which is responsible for overseeing 250 million acres of surface land and 700 million acres of subsurface mineral rights—also is evaluating its regulatory program in light of hydraulic fracturing.²⁷ Hydraulic fracturing "is used on about 90 percent of wells drilling on federal land."²⁸ Deputy Secretary of the Interior David J. Hayes has questioned the adequacy of existing regulations applied to natural gas and oil drilling on federal lands because of concerns regarding the potential impact of hydraulic fracturing on ground and surface water. This suggests that new proposed regulations may be forthcoming.

The federal government's various investigations into hydraulic fracturing could result in legislation or rulemakings that could affect how these operations are conducted and permitted.

PENNSYLVANIA DEVELOPMENTS

Enforcement. In December 2010, DEP entered into a \$4.1 million settlement with Texas-based Cabot Oil & Gas Corporation, concerning methane contamination of water in Dimock Township, Susquehanna County, Pennsylvania.²⁹ The settlement includes, for each of 19 families, a payment

equal to twice the value of their home, with a minimum payment of \$50,000.³⁰ Cabot will resume well completion operations in the Dimock area after complying with the settlement agreement's terms, which is expected to be in the first quarter of 2011.

Legislation and Regulation. Pennsylvania legislators and regulators also have been active. EQB and the Pennsylvania Independent Regulatory Review Commission ("IRRC") approved a new regulation, effective August 21, 2010, that sets maximum TDS concentration levels in wastewater discharges from natural gas drilling operations at 500 milligrams per liter.³¹ Five hundred milligrams per liter is EPA's national secondary standard for TDS. National secondary standards are nonenforceable guidelines regulating contaminants that may cause cosmetic effects (such as discoloration) or aesthetic effects (such as taste, color, or odor) in drinking water. EPA recommends secondary standards but does not require water systems to comply. However, as in this case, states can adopt secondary standards as enforceable standards.

Background TDS levels in Pennsylvania streams are estimated to range from 159 milligrams per liter to 2,667 milligrams per liter.³² The natural gas industry has opposed this regulation as "unreasonably stringent"³³ and lacking "any additional environmental benefit."³⁴ Others, however, have identified recycling of drilling wastewater as "an increasingly

26 *Id.*

27 "BLM Weighs Regulations on Hydraulic Fracturing," *BNA Daily Env't Rep.*, Dec. 1, 2010, available at http://news.bna.com/deln/display/link_res.adp?lt=email&fname=A0C5M3F5C8&lf=eml&emc=deln:deln:118.

28 *Id.*

29 Press Release, Cabot Oil & Gas Corporation, Cabot Oil & Gas Corporation Announces Global Settlement with the Pennsylvania Department of Environmental Protection (Dec. 15, 2010), available at http://phx.corporate-ir.net/staging/phoenix.zhtml?c=116492&p=irol-newsArticle__print&ID=1508409&highlight=.

30 Press Release, Pa. Dep't of Env'tl. Prot., Dimock Residents to Share \$4.1 Million, Receive Gas Mitigation Systems Under DEP-Negotiated Settlement with Cabot Oil and Gas (Dec. 16, 2010), available at http://www.portal.state.pa.us/portal/server.pt/community/search_articles/14292 (search "Search Text" for "Dimock Residents").

31 25 PA. CODE § 95.10 (2010); 40 Pa. Bull. 4835 (Aug. 21, 2010).

32 *Notice of Final Rulemaking, Wastewater Treatment Requirements*, Department of Environmental Protection, Environmental Quality Board, at 46 (TABLE), available at http://www.portal.state.pa.us/portal/server.pt/gateway/PTARGS_0_2_822197_0_0_18/Order_TDS_Final_RulemakingB.pdf.

33 Lorraine McCarthy, "New Discharge Limits, Erosion Controls Target Gas Drilling Impacts in Pennsylvania," *BNA Daily Env't Rep.*, Aug. 5, 2010, available at http://news.bna.com/deln/display/link_res.adp?lt=email&fname=A0C3X2R1M8&lf=eml&emc=deln:deln:120.

34 Press Release, Marcellus Shale Coalition, MSC Statement on New Water Treatment Rules (June 17, 2010), available at <http://marcelluscoalition.org/2010/06/msc-statement-on-new-water-treatment-rules/>.

workable solution” in light of new technologies.³⁵ By way of comparison, some states, including Texas, Oklahoma, New York, Iowa, Virginia, Arkansas, and Tennessee, prohibit the return of any drilling wastewater to streams.

In addition, new regulations regarding erosion and sediment control became effective on November 19, 2010.³⁶ The new regulations “mandate a 150-foot buffer along the 20,000 miles of Pennsylvania waterways that are designated as ‘exceptional value’ or ‘high quality,’” provide an updated permit fee structure, and enhance agricultural stormwater management provisions.³⁷ On November 18, 2010, IRRC also unanimously approved rules concerning oil and gas well construction, which require quarterly well inspections, reports to DEP of production and waste volumes, and compliance with provisions regarding the installation and operation of blowout prevention equipment.³⁸

On March 22, 2010, Pennsylvania’s Oil and Gas Act was amended to require well operators to submit semiannual natural gas production reports and DEP to post such reports on its web site.³⁹ The first report was due August 15, 2010, and DEP had until November 1, 2010 to begin posting the reports on a publicly accessible web site.⁴⁰ Several pieces of legislation are pending concerning, among other issues, well spacing, buffer zones between wells and drinking water sources, disclosure of data regarding the chemicals used in hydraulic fracturing, and drilling in state forests.

OTHER CONSTITUENCIES

Other regulators also have been active concerning hydraulic fracturing in the Marcellus Shale. The Delaware River Basin Commission (“DRBC”)—which regulates water sources in the Delaware River Basin, including portions of Pennsylvania—currently has a moratorium on nearly all Marcellus Shale drilling within the river basin.⁴¹ DRBC has stated that it will lift the moratorium once it has sufficient regulations in place.

DRBC proposed these regulations for public comment on December 9, 2010.⁴² The proposed regulations would require drilling companies to develop and submit for approval plans for siting and accessing natural gas development projects.⁴³ The new regulations would apply to “all natural gas development projects involving siting, construction, or use of production, exploratory, or other wells in the basin regardless of the target geologic formation, and to water withdrawals, well pad and related activities, and wastewater disposal activities comprising part of, associated with, or serving such projects.”⁴⁴

The proposed rules also would require that DRBC approve any water source to be used for natural gas development; specify minimum setbacks for well pads from certain water supplies, including water bodies, wetlands, surface water supply intakes, and water supply reservoirs; require financial assurance of \$125,000 per natural gas well; and require

35 “New Discharge Limits, Erosion Controls Target Gas Drilling Impacts in Pennsylvania,” *supra* note 33.

36 25 PA. CODE § 102 (2010); 40 Pa. Bull. 4861 (Aug. 21, 2010) (correction to final publication Sept. 18, 2010).

37 “New Discharge Limits, Erosion Controls Target Gas Drilling Impacts in Pennsylvania,” *supra* note 33.

38 Lorraine McCarthy, “Stricter Gas Well Construction Standards Clear Final Review Hurdle in Pennsylvania,” *BNA Daily Env’t Rep.*, Nov. 19, 2010, available at http://news.bna.com/deln/display/link__res.adp?lt=email&fname=A0C5E8X5G1&lf=eml&emc=deln:deln:108.

39 Act of March 22, 2010, No. 15, P.L. 169 (eff. May 21, 2010)

40 S.B. 297, 2009-2010 Leg., Reg. Sess. (Pa. 2010). The production reporting information is available on DEP’s web site at http://www.dep.state.pa.us/dep/deputate/minres/oilgas/OGRE__Production/ogreproduction.htm.

41 Some exploratory wells are grandfathered. Environmental groups have recently sued to stop these grandfathered exploratory wells as well. Lorraine McCarthy, “Lawsuit Challenges Regulatory Exemptions for Test Gas Wells in Delaware River Basin,” *BNA Daily Environment Report*, Feb. 3, 2011, available at http://news.bna.com/deln/display/link__res.adp?lt=email&fname=A0C6F3A5X6&lf=eml&emc=deln:deln:115.

42 Delaware River Basin Commission, Basin Regulations, Part III, Art. 7, Dec. 9, 2010, available at <http://www.state.nj.us/drbc/naturalgas-draftregs.pdf>.

43 *Id.*

44 Draft Natural Gas Development Regulations, Delaware River Basin Commission, available at http://www.state.nj.us/drbc/notice__naturalgas-draftregs.htm.

wastewater treatment facilities to obtain DRBC approval to accept wastewater from natural gas development projects by showing that Safe Drinking Water Act standards would not be exceeded and that zone-specific water quality objectives would not be violated by the treated wastewater's discharge.⁴⁵ DRBC, however, will defer to Pennsylvania and New York to regulate both the construction and operation of natural gas wells within their borders.⁴⁶

CONCLUSION

Developments that have the potential to affect natural gas development in the Marcellus Shale happen almost weekly. Natural gas companies operating in Pennsylvania's Marcellus Shale should closely monitor EPA's growing policy-making and enforcement role, calls for new legislation and regulation, and the legislation and regulations currently pending before federal and state legislative and regulatory bodies. Areas of increased legislative, regulatory, and enforcement focus include ambient air quality and emissions from drilling sites, water withdrawal, protection of groundwater and drinking water resources, and compliance with federal and state requirements pertaining to well construction and operation.

Frack water disposal will continue to garner a great deal of attention. Current estimates predict that Pennsylvania will produce 20 million gallons of frack water per day once

Marcellus Shale drilling reaches its full potential.⁴⁷ The Marcellus Shale formation presents a formidable economic opportunity for Pennsylvania. With great opportunities come great responsibilities and the challenge of making the most of the economic opportunity while protecting safety and Pennsylvania's environment and natural resources.

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45 Delaware River Basin Commission, Basin Regulations, Part III, Art. 7, *supra* note 42.

46 *Id.*

47 See John H. Hines, DEP Deputy Secretary for Water Management, Presentation: Chapter 95—Wastewater Treatment Requirements, at 4, available at <http://www.portal.state.pa.us/portal/server.pt?open=18&objID=504375&mode=2>.