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Feb. 28, 2011

Re: Additional Comments on Hydraulic Fracturing Study Plan Review Panel

Dear Mr. Hanlon:

I represent the Delaware Riverkeeper Network and the Delaware Riverkeeper, Maya van Rossum. We submitted a comment letter dated February 25, 2011, as well as eleven expert reports addressing various impacts to water resources implicated by the construction and installation of vertical wells intended for natural gas exploration and production in the Marcellus Shale contained within the Delaware River Basin.

Please accept these additional comments on the Environmental Protection Agency's Hydraulic Fracturing Study for consideration by the Plan Review Panel. In drafting these comments, we have relied heavily on input from Mr. Richard A. Raiders, a law student in our clinical program who has B.S. and M.S. degrees in petroleum engineering and more than twenty-two years of experience working in the field of environmental engineering and compliance.

The Environmental Protection Agency (EPA) Science Advisory Board (SAB) has proposed a draft work plan to study the effect of hydraulic fracturing of gas bearing formations on surface- and groundwater resources through various retrospective, prospective, and research studies. The proposed EPA work plan addresses many important issues. However, EPA must improve the proposed work plan to include and address critical issues related to natural gas development through hydraulic fracturing that have potentially significant deleterious effects on drinking water and the communities that rely on sources of safe drinking water. These effects may stem not only from the deliberate, intentional use of water in the hydraulic fracturing process, as the current study plan focuses on, but also the various impacts on drinking water from well construction and associated infrastructure development and non-intentional contamination through accidents or failure to adhere to appropriate environmental standards.



## Radioactive Contamination from Wastewater and Other Drilling-Related Sources

According to the reporting by Ian Urbina in the New York Times dated February 27, 2011, titled Regulation Lax as Gas Wells' Tainted Water Hits Rivers, EPA already has studies or evidence in its possession that demonstrate that wastewater from hydraulic fracturing operations may be highly contaminated with NORM and is being sent to treatment plants that are not equipped to treat such waters to drinking water quality standards. The article also cites information obtained from industry sources concluding that the radioactivity in fracking waste cannot be fully diluted in rivers and other waterways. Moreover, as the article reported, these plants are not being required by the States or by the EPA to test for the presence of such radioactive materials.

See <http://www.nytimes.com/2011/02/27/us/27gas.html>

and documents cited therein.

The potential for contamination of drinking water with radioactive substances via hydraulic fracturing wastewater is obviously extremely significant. As such, the EPA must expand the focus of the study's section on the treatment and disposal of fracking wastewater to analyze this issue in detail. It is incumbent on the EPA to include, as part of this study, testing of wastewater before and after treatment at water treatment facilities for contamination by radioactive materials.

Radioactive materials present in wastewater also pose the risk of contamination to drinking water sources via accidental spills, leakage from in-ground pits, and injection into underground disposal wells. EPA should ensure that all stages of its analysis take into account the risks that NORM-contaminated wastewater and other materials produced during the natural gas development and extraction processes pose to drinking water quality.

### Well Data

EPA appropriately proposed to study production well failures, suspected contamination, and coalbed methane issues. However, well construction and fracture design may affect the impact of the fracturing process on nearby water quality. If an oilfield service company overstimulates a well, either accidentally or by design, the fractures created during the hydraulic fracturing project could propagate beyond the target formation. If the service company fractures the cap formation, and possibly other formations preventing fracturing or production fluids from entering potable water supplies, these oilfield activities could cause indirect long-term water supply problems.

Likewise, EPA should collect any available recompletion data for any shale gas wells. Second attempts to fracture a well rely on the original fractures to provide avenues for produced gas to be captured by a production well. Because the formation is already fractured, the service company performing the fracture may have less control over



where a refracture may spread. Recompletion procedures could also weaken wellbore cement, potentially causing unwanted fluids to travel through the well annular space and possibly into potable water formations. EPA should understand, using actual well data or simulation models, how contemporary refracture and/or recompletion practices may breach either cap rock formations or the wellbore.

EPA should also collect any historic or contemporary cement bond log information, especially for surface casing intended to protect potable water supplies. EPA should inquire if cement bond log data is available for shale gas wells, especially wells known or suspected to have failed and wells in the vicinity of known or anticipated potable water supply problems. In addition, EPA should collect data concerning the use (or lack of use) of centralizers in surface casing. If operators are not collecting cement bond log data from current wells, EPA should request that operators begin to log shale gas wells right after the operator sets the surface casing. Centralizer use and application data would allow EPA to evaluate the relationship between casing position, cement integrity, and well failure in the fate of potable groundwater supplies. Such data would allow EPA to understand if and how casing, cement, or centralizing problems affect sources of drinking water either at the surface or below ground.

#### Water Acquisition

The proposed water acquisition research studies would provide valuable knowledge for decision-makers in upcoming hydraulic fracturing related regulations. EPA's focus on drinking water supply, including cumulative impacts concerning multiple fracturing projects on a single waterway, appropriately captures one of the critical issues in this area. However, EPA should include goals to evaluate not only drinking water quality impacts, but also impacts on the various ecosystems in the affected watersheds. Seemingly insignificant changes in water quality can have a dramatic impact on several sensitive plant and animal species. Specifically, withdrawal of millions of gallons of water per well could cause increases in suspended solids, salinity, color, or temperature that could impact downstream ecosystems.

EPA's water acquisition studies should evaluate the impact of water withdrawals on downstream water quality. A trace constituent in a waterway that may not pose significant risk at current river flows could become a health hazard for downstream users at slightly higher concentrations.

The quality of streams and their ecosystems is directly related to the quality of surface water, affecting drinking water supplies drawn from the waterway. Therefore, EPA should also analyze the impact of water withdrawals from a surface water body on habitat for species dependent on the existing natural flow regime of the stream. As evidenced in the "Rules and Regulations for the Protection from Contamination, Degradation, and Pollution of the New York City Water Supply and its Sources" adopted by New York City for the protection of its source waters in the Delaware River watershed that flows to the City's reservoirs, one of three main causes of degradation and contamination to the City's source waters is "Urban, suburban, rural, mining,



silvicultural and agricultural land use practices that result in nonpoint source runoff of pollution and/or in adverse changes in the natural rate at which water flows into and through a delineated drainage basin". (Final Regulations, page 2)

Therefore, water flows must be analyzed as part of EPA's study. Changes in volume of flow as well as the natural variation and seasonal changes to a stream's regime directly impacts aquatic life - biota, fish, insects, etc. - as well as wildlife and flora and fauna populations that have adapted to natural stream conditions. Additionally, stream morphology is impacted by changes in flow, impacting stream life, downstream volume and rate of flow, and water quality. Withdrawals can also impact groundwater and aquifer recharge and base flow quality conditions of hydrologically connected surface waters and water-dependent features such as wetlands and verbal pools. Streamside shallow groundwater conditions can also be impacted. These hydrologically based and flow regime changes need to be evaluated and considered in water acquisition studies by EPA.

#### Impacts of Well Construction

As detailed in our letter of February 25, 2011, the impacts of vertical well construction as well as associated infrastructure cannot be discounted as a significant cause of drinking water quality degradation, particularly given the scale on which intensive gas development will alter the natural landscape, causing erosion, sedimentation, and stormwater issues on a large scale.

Best Management Practices for erosion and sedimentation control for pad development should also be reviewed by the EPA, since sediment pollution can severely affect benthic macroinvertebrates living in the stream and eliminate the habitat they need to survive by consolidating riffle habitats. Macroinvertebrates help filter out nutrients and other pollutants that directly affect the drinking water quality downstream. As richness and diversity of EPT (Ephemeroptera-Plecoptera-trichoptera species) are lost within the benthic community, so are the benefits they provide to drinking water downstream. As Dr. David Velinsky of the Academy of Natural Sciences has pointed out, this could create the need for more treatment procedures for drinking water downstream.

In the Delaware River Watershed, drilling is proposed for the most diverse headwater streams that remain in our Watershed and therefore, is a great potential threat to the diversity that sustains our clean drinking water downstream where benthic life may already be less diverse due to historic development and impacts from stormwater and other land use changes.

The EPA should consider and track waivers and exemptions records and the frequency of these exemptions with the state permitting process for Oil & Gas. For example, state regulations may be put in place to include floodplain protections or setbacks from wetlands, but in reality, waivers may be applied for by the industry that would put these industrial activities in sensitive and unstable habitats that could affect drinking water.



## Chemical Mixing

EPA appropriately proposes to study the hazards of various materials used, or potentially used, in hydraulic fracturing projects. EPA should expand this study to evaluate the full life cycle of water used at a well: drilling fluids, completion and fracturing fluids, and produced waters. Water used in each step of the process typically contains different added and naturally occurring water pollutants. EPA should attempt to understand the nature of how each fluid changes composition in use. This study would allow EPA to develop or optimize test methods to detect trace concentrations of potentially toxic or other pollutants in these streams. Current SW-846 analytical data may not provide the requisite sensitivity to detect materials known or suspected to be in fracturing or produced water. Matrix interferences from the clays typically found in drilling mud may complicate evaluate of toxic materials in drilling muds.

EPA should consider both acute and chronic risks in each class of aqueous streams generated during well drilling and production. Some of the materials identified in various water studies, including n-hexane, tetrachloroethylene, and naturally occurring radioactive materials (NORM) can exhibit toxic effects at very dilute concentrations. EPA should perform comprehensive analytical evaluations in several samples of produced and generated fluids, using the most sensitive analytical methods available, to determine what trace constituents may cause human health or other pollution harms.

EPA should then take this data and evaluate treatability of all constituents known or suspected to be contained in these fluids. Where current data exists, EPA could rely on such data. However, in some cases trade secret or other trace compounds could cause substantial potable water supply risks should they reach drinking water or surface water supplies.

In this proposed study area, EPA is missing a major opportunity to evaluate the actual need to use many very toxic materials in fracturing water. Some constituents are not expressly needed in this service. Operators, if requested, should be able to identify a variety of less toxic alternatives to the current additives practices.

EPA appropriately proposes to study spills that potentially impact drinking water quality. EPA should also collect data on well construction issues that negatively affect drinking water supplies. EPA should also identify and track best management practices (BMPs) used by drillers and fracturing contractors to determine if truly best practices are routinely being followed. Following existing state law may or may not adequately protect water supplies.

EPA should further evaluate flowback and produced water chemistry to determine if the dissolved materials in such water significantly change based on when the water is produced. Similarly, EPA should consider how to discern what constituents in produced water occur from surface activities, and which constituents naturally occur in-situ. EPA should also integrate information from wellbore and fracturing failure into this study. The



fate and transport of produced water, especially relating to wellbore or formation failure, will provide EPA with critical insight concerning future regulation of this industry.

As stated in our letter of February 25, 2011, EPA's study must also take into account chemicals that are neither naturally occurring nor used in the drilling or fracturing processes but that are created via interactions with these two classes of substances. We point to the example of 4 Nitroquinoline 1-oxide (4NQO), a powerful carcinogen that has been identified in wastewater produced by natural gas drilling. This chemical compound is not a drilling or hydraulic fracturing additive and it is also not found naturally in the geologic formations that produce flowback water during the stimulation process. Apparently, it is formed through interaction of the chemicals that are present in these fluids. This is one example, but there are potentially more such compounds that should be identified and addressed through EPA's study.

### Injection

The proposed work plan will identify critical issues associated with fluid injection during fracturing operations. The proposed well failure analysis for known well failures will assist EPA in future rulemaking efforts. However, EPA should also study a control group of wells not believed to have failed to establish both if these wells exhibit adequate structural integrity and to provide as a control basis for the failed well study. The differences between a failed cement job and a successful well job can be subtle, which may only be determined by conducting cement bond logs on failed and control wells. For example, if the surface casing is offset in the wellbore by an inch or less, the cement fastening the surface casing into the wellbore may not adequately isolate potable water supply from fracturing fluids used during well completion. EPA should use statistical control methods to inform this analysis.

EPA should also review other pathways that may cause groundwater contamination. For instance, if a service company overpressures a formation during the fracturing process, the fracture may propagate beyond the design fracture location. EPA should study overfracturing and determine if overfracturing may affect overburden formations, up to and including potable water bearing formations. EPA should also review any relationship between high fracturing pressure and cement stability. EPA should review the cement strength used for surface casing cementing and final production casing cement projects, to determine if the junction between the surface casing and the production casing may be a cause of potential well failure. If fracture injection pressures exceed the maximum compression pressure that the cement may withstand, the cement, properly placed into a well, could still fail.

EPA should also review the presence or absence of coal seams or other soft formations that may occur near potable water formations and/or near the bottom of the surface casing. Soft formations like coal seams may be more difficult to seal during cementing operations than typical sandstones, limestones, and shales. EPA should also review other potential causes of formation breach, such as abandoned or plugged wells or other wells within one to two miles of locations where potable water supplies may have



been compromised. By conducting a comprehensive review of causes of potential drinking water contamination, EPA can advance the understanding of how shale gas drilling relates to groundwater contamination.

In reviewing mechanical integrity, EPA should review all downhole equipment, including casing materials of construction, any plugs used during drilling and casing installation, and any other downhole equipment. EPA should also review how various permitting authorities authorizing drilling determine the lowest potable water bearing formation to validate that current surface casing practices are designed to protect all potable groundwater resources.

EPA appropriately identifies degradation products of fracturing fluid components as a study goal. EPA also appropriately proposes to study the water contaminants carried out of the fractured formation during fracturing. EPA also proposes to begin the study of trace water contaminants in fracture water. However, EPA should review the ability of the current wastewater analytical methods to detect trace amounts of potentially toxic fracturing additives and in-situ contributors to fracturing water contamination. Method development takes significant planning and design time, and EPA should identify method development needs as soon as possible. The sooner EPA evaluates the toxicity of naturally occurring and fracturing additive water contaminants, the more valuable EPA's work will become.

#### Flowback

EPA appropriately proposes to review spill and pit leakage contributions to water contamination issues associated with hydraulic fracturing. EPA should review all available hydraulic fracturing models, well logs, and seismic data to determine where conduits between well fluids and groundwater resources may exist.

EPA should also evaluate water quality data from direct discharges and from indirect dischargers who route flowback to wastewater treatment facilities. The existence of treatment facilities may not indicate adequate wastewater treatment. Treatability is a critical element of mitigating pollution from flowback waters, especially in areas where operators rely on wastewater treatment plants not necessarily designed to manage these industrial wastewater streams. To better understand this issue, EPA should collect and analyze information concerning how flowback waters may be treated, and how much of the many pollutants are actually removed by wastewater treatment plants currently used to treat flowback water.

EPA has also conducted research that shows that aquatic invertebrates such as mayflies, for example, appear very susceptible to increased total dissolved solids. If gas drilling flowback water reaches streams through accidents and spills, large die offs of benthic macroinvertebrates could occur (US EPA Region 3 Freshwater Biology Team). Even in the absence of other stressors (pH, organic enrichment, habitat quality, metals) TDS/conductivity significantly explains impairment of aquatic life use. As stated above, the impairment of healthy ecosystems with flourishing aquatic invertebrate communities



may degrade drinking water quality and create the need for additional water treatment to bring waters back up to drinking quality standards.

#### Wastewater Treatment and Disposal

EPA proposes to use a chloride balance to evaluate salinity in produced and flowback waters. EPA should further study related salts, such as bromides, sulfates, fluorides, and other salts that may exhibit effluent toxicity upon discharge. EPA should also propose a study of less toxic alternative materials that operators may use to accomplish well completion goals while minimizing environmental risks. Less toxic drilling fluids, completion fluids, and fracturing fluids are likely available for use in drilling and hydraulic fracturing. EPA should take this opportunity to study the need for toxic additives such as perchloroethylene, n-hexane, and benzene in fracturing fluid systems. Further study will likely identify less toxic suitable additives. By delaying requiring less toxic alternatives in drilling and well completion, EPA unduly risks contaminating groundwater supplies with materials not needed to conduct drilling operations.

EPA also should study the fate of drilling cuttings on water quality. Drilling cuttings may be contaminated with a wide variety of added or naturally occurring wastewater contaminants that may leach out from Subtitle D landfills and onsite burial disposal facilities. EPA should study contamination levels in drilling cuttings and disposed drilling fluids, and evaluate what steps may be needed to isolate potential contaminants from groundwater and surface water supplies.

Finally, as stated at the beginning of this letter, it is critically important that the EPA's study conduct a detailed analysis of all waters produced by drilling and hydraulic fracturing for contamination with NORM and a detailed analysis of the fate of such contaminated waters and their impacts on sources of drinking water.

Thank you for the further opportunity to comment on EPA's draft study.

Very truly yours,

**Jane P.  
Davenport**

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Senior Attorney, Delaware Riverkeeper Network  
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February 25, 2011

Re: Hydraulic Fracturing Study Plan Review Panel

Dear Mr. Hanlon,

I represent the Delaware Riverkeeper Network and the Delaware Riverkeeper, Maya van Rossum. DRN has taken a lead role in protecting the waters of the Delaware River, which supplies drinking water for more than 15 million people. We have taken a keen interest in the issue of hydraulic fracturing for natural gas in shale formations such as the Marcellus Shale because of the potential for severe, if not catastrophic, harm to the Basin's irreplaceable drinking water resources.

Although the EPA Hydraulic Fracturing Study Plan is a good start, its scope has been unduly narrowed to focus only on the deliberate and intentional use of water in the hydraulic fracturing process itself. This study design excludes consideration of impacts to drinking water from critical steps in the natural gas extraction process such as surface level construction, vertical well installation, road and pipeline installation and use, and more. It is simply not the case that the only impacts to drinking water resources will occur from the deliberate use of water in the hydraulic fracturing process itself. The EPA study should not limit consideration only to the intentional use of water in the hydraulic fracturing process alone, but encompass the larger water quality impacts caused by the shale gas well installation and extraction process as a whole.

We intend to submit additional comments on the Environmental Protection Agency's Hydraulic Fracturing Study Plan via fax and email on Monday, February 28, 2011, in time for the Scientific Advisory Board's consideration at the meeting scheduled for March 7-8, 2011. As an initial submission, however, I enclose for the SAB's consideration a number of expert reports that were prepared for the Delaware Riverkeeper Network and the Delaware River Basin

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Commission for a hearing on the impacts to water quality from vertical wells drilled for shale gas exploration in the Delaware River Basin.<sup>1</sup>

Among other issues, these reports specifically address adverse impacts to water quality that are likely to occur specifically because of well pad construction and vertical well installation. Adverse impacts to drinking water quality may occur at many points in the gas development and exploitation process and are not limited to impacts from horizontal drilling and/or hydraulic fracturing.

Actual and potential water quality impacts from vertical well construction and installation identified in these expert reports include:

- Impacts to water quality from sedimentation and erosion as well as stormwater runoff resulting from land disturbance from pad site, entrance road, and pipeline facility construction as well as widening or paving of existing roads and increased road traffic (Adams, O'Dell, Sildorff)
- Chemical and biological contamination to ground water resulting from the chemical products used in both drilling muds and air drilling as well as naturally occurring chemical, biological, and/or radioactive substances mobilized by drilling. Contamination of water may occur either below ground (e.g., through casing or grouting failure or annular channels) or above ground (e.g., from drill cutting pits and waste disposal) (Bishop, Demicco, Harvey, Rubin, O'Dell, Sildorff)
- The water quality impacts of a well blowout, not only from the produced fluids and naturally occurring fluids ejected during the blowout but also from the chemical suppressants and water withdrawals used to cap wells and contain blowouts (Harvey)
- Adverse water quality impacts resulting from stray gas migration when vertical wells are not properly cased and cemented, thus allowing natural gas in subsurface formations to migrate from the wellbore through bedrock and soil, contaminating aquifers and drinking water wells (Harvey, Rubin)
- Adverse water quality impacts resulting from the penetration by vertical wells of bedrock joints that may result in hydrological connections between saline and freshwater horizons by opening inter-formational pathways. (Rubin)
- Clearing and fragmentation of forested areas and degradation of riparian zones related to well pad construction result in adverse impacts to drinking water. Intact forest ecosystems and riparian buffers are critically important to protecting stream water quality from non-point source pollution and nutrient loading, particularly in the headwaters of the Delaware River Basin (Owens, Jackson & Sweeney)

Because surface level construction, site use, and vertical well installation are prerequisites to any horizontal drilling and hydraulic fracturing processes, EPA should address the impacts of these activities in its study design to fulfill Congress' mandate and ensure a complete picture of the impacts to drinking water.

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<sup>1</sup> Five of the reports (Anderson & Kreeger, O'Dell, Sildorff, Jackson & Sweeney, Volz) were produced at the request of the Delaware River Basin Commission, which has no affiliation with the Delaware Riverkeeper Network. These reports are publicly available documents.



More generally, these expert reports highlight some of the shortcomings of the current scope of the proposed EPA study and illustrate how the study, as proposed, will not fulfill Congress' mandate to study the cumulative effects of shale gas extraction on drinking water quality. Many additional elements of the shale gas extraction process need to be studied for their potential impacts to drinking water quality. For example:

- It is inappropriate to exclude consideration of air quality impacts resulting from natural gas production wells from the EPA study, because air quality impacts can cause water quality impacts, as air pollutants precipitate and deposit both on ground surfaces and water surfaces (Harvey).
- Seismic activity in areas of vertical well installation and hydraulic fracturing has significant implications for impacts to drinking water quality. Seismically active regions such as the Marcellus Shale have a high likelihood over time of significant ground motion that may instantly shear multiple well casings, opening connections between formerly separated freshwater and saline horizons and permitting natural gas migration as well as contamination from produced waters. (Rubin)
- Multiple pathways of water quality degradation from surface and subsurface activities relating to well pad construction and shale gas extraction may result in impacts to aquatic biota such as freshwater mussels. In the Delaware River, large assemblages of these filter feeders play a critical role in maintaining the drinking water quality of the River. Yet these species are highly susceptible to the impacts that natural gas well construction and hydraulic fracturing may inflict, such as increased sedimentation, increases in suspended sediments, water quality degradation from brines and other contaminants, inadequate flows and dewatering, invasive species, and forest fragmentation. (Anderson & Kreeger, Sildorff)
- It is also incumbent on the EPA not merely to identify possible contaminants (whether natural or manmade) that may affect drinking water quality but also to examine the potential health impacts of drinking water contamination on human populations. I draw your attention to the Teitelbaum paper and its appendices on this issue.
- EPA should examine the interactions between naturally occurring and manmade chemicals introduced through the drilling and fracturing processes. Biochemist Ron Bishop, whose report is attached, has identified 4 Nitroquinoline 1-oxide (4NQO), a powerful carcinogen, in the wastewater produced by natural gas drilling. He has informed DRN that this chemical compound is not a drilling or hydraulic fracturing additive and it is also not found naturally in the geologic formations that produce flowback water during the stimulation process. Apparently, it is formed through interaction of the chemicals that are present in these fluids.
- The presence of this extremely powerful carcinogenic compound is a serious health concern and immediately requires further investigation since it is being found in currently produced gas drilling wastewater in New York State and perhaps in Pennsylvania as well. 4NQO is used in cancer research to induce cancerous tumors in animals for study. It is one of the most potent of all cancer causing chemical compounds. (See, e.g., <http://bit.ly/gdzwIP>).



Thank you for the opportunity to comment on EPA's draft study. For your convenience, I enclose a binder with one paper copy of each of these expert reports (without appendices) as well as twenty-four duplicate copies of all reports plus appendices on CD for the use of the members of the SAB.

Very truly yours,

Jane P.  
Davenport

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Jane P. Davenport  
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April 15, 2011

Dear Commissioners:

Please see the attached new report from OGAP and consider the findings in the regulations related to protecting communities, air and water.

Sincerely,

Faith Zerbe  
Delaware Riverkeeper Network





December 8, 2010

Commissioners  
Carol Collier, Executive Director  
Delaware River Basin Commission  
West Trenton, New Jersey

Dear Commissioners and Director Collier,

**We resubmit this letter with additional organizations who have signed their names to this letter after the date we submitted the letter to DRBC on October 14, 2010. Additional organizations are shown in bold italics. One-hundred groups, representing sportsmen's groups, religious institutions, watershed groups, veterans groups, peace and sustainability groups, regional and national environmental groups have signed on. We reiterate our grave concerns with the current DRBC plan to release the Draft gas rules before a cumulative impact assessment is done. The retort that rules can be amended after a study is done ignores the fact that environmental damage that occurs as a result of ineffective or incomplete regulations in the meantime cannot be undone. The most effective and cost-efficient approach is to study first, then develop regulations based on the findings, before natural gas development occurs.**

We applaud that the Commission has deferred action on natural gas production well applications in the Delaware River Basin while developing natural gas-specific regulations that will apply to all gas-related projects within the Watershed. These regulations are essential to protect the water supply for over 15 million people and to assure that the Special Protection Waters of the Delaware River are protected from pollution and degradation. It makes eminent sense to withhold permitting of gas wells while the rules that would govern these activities are being developed.

The Commission's Executive Director Determination (EDD) dated May 19, 2009 reviewed the responsibilities of the Commission and explained that the Commission's rules in part state that projects fall under the purview of the Commission if there exists: "...a potential substantial water quality impact on waters classified as Special Protection Waters." The EDD further explains: "Most of the shale formations that may be subject to the new horizontal drilling and hydraulic fracturing techniques are located within the drainage area to Special Protection Waters. The Executive Director has considered and has now determined that as a result of water withdrawals, wastewater disposal and other activities, natural gas extraction projects in these shale formations may individually or cumulatively affect the water quality of Special Protection Waters by altering their physical, biological, chemical or hydrological characteristics."

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As you know, the Commission applied for federal funding for a cumulative impact study on the effects of natural gas development on the water resources of the Basin. On June 23 it was announced that the House Appropriations Committee Subcommittee on Interior, Environment, and Related Agencies approved \$1 million for the U.S. Geological Survey (USGS) and the Commission to conduct that study. The bill's sponsors are pressing for passage in the coming weeks. With this study, the Commission will be able to inform the needed rulemaking process so that effective regulations can be adopted to prevent pollution and degradation of the River's Special Protection Waters. The foresight the Commission has shown in seeking the funds that are now being moved through the approval process is exemplary and will make the Commission's goals set in the EDD possible. We are, as a Watershed community, at the beginning of a planning and regulatory process that appropriately reflects the gravity of the new expected activity and applies an approach that brings both science and sound planning policies to this task.

However, there are pitfalls ahead. First, the Commission announced in July that it is fast-tracking its natural gas regulations. A letter submitted by New Jersey Commissioner Bob Martin dated July 13, 2010, urged that regulations be promulgated no later than September 30, 2010. Apparently in response to this letter, the Commission has agreed to issue draft regulations by that date and adopt final regulations by the end of the year. But this is prior to the cumulative impact study that is being funded by the federal government to assess the impacts of natural gas development in the Basin. This study is essential to developing appropriate rules. Further, this schedule does not allow for adequate public participation in the critical rulemaking. This issue, as you know, has resulted in more public comments than any other single issue in the Commission's history. The public has a deep desire for a robust public participation process regarding these regulations.

The second pitfall is that the Commission is not deferring action on water withdrawals and wastewater discharges and that a number of "exploratory" wells have been "grandfathered", avoiding Commission approval. The EDD identifies water withdrawals, wastewater discharges and all activities related to natural gas development as potential threats to water resources. Yet the Commission is allowing these exempted activities to move ahead before specific regulations are adopted. This apparent acceptance of the risk of pollution and degradation is not consistent with the determinations of the Commission, including the 2009 EDD and the Supplemental EDD of June 14, 2010, and has the potential to result in environmental harm that cannot be undone. The Commission's considered approach is in danger of unraveling.

The practical problem posed by this loophole is that several water withdrawal applications for hydraulic fracturing of gas wells are being moved through the Commission's approval process prematurely. Stone Energy received approval July 14 for .70 million gallons of water per day (mgd) from the West Branch of the Lackawaxen River and 2 new withdrawal applications have been filed recently: XTO Energy for 0.25 mgd from Oquaga Creek (flows to the West Branch Delaware River) in Broome County, NY and up to 200,000 gpd of water from the Village of Deposit's wells in the West Branch of the Delaware River Watershed in Broome and Delaware Counties, NY for Newfield Appalachia PA's gas wells. All these withdrawals are within Special Protection Waters and display the beginning of a rush for water that should be on hold.

We, the undersigned, respectfully request:

- The Commission defers all action on natural gas, including the issuance of draft natural gas regulations, until the cumulative impact study on the impacts of natural gas development on the water resources of the Basin is concluded so that these findings may inform the rulemaking process to prevent pollution and degradation of the waters of the Basin and the River's Special Protection Waters.



- No action is taken to approve water withdrawals, wastewater discharges, and development of natural gas from all geologic formations until natural gas-specific regulations are adopted and further that all test wells, regardless of permitting status by the States, be held in abeyance and included in the Commission's review and approval program.

We request these actions be taken at the September 15 meeting of the Commission, or sooner.

Respectfully submitted,

American Canoe Association, John P. Brunner, Chair, Delaware Valley Division, National  
 American Rivers, David Moryc, Senior Director of River Protection, National  
**Appalachian Mountain Club, Mark Zakutansky, PA Highlands Coordinator, PA**  
 Association of New Jersey Environmental Commissioners, Sandy Batty, NJ  
 Burnham Park Association, Dr. Lynn L. Siebert, President, NJ  
 Catholic Daughters of the Americas, Mary Smith, Diocese of Rochester, NY  
 Catholic Daughters of the Americas, New York State, Mary Smith, NY  
 Catskill Citizens for Safe Energy, Jill Wiener, NY  
 Catskill Mountainkeeper, Wes Gillingham, Program Director, NY  
 Chemung County Church Women United, Mary Smith, NY  
 Chemung County Council of Churches, Mary Smith, NY  
 Chemung County Council of Women, Mary Smith, NY  
**Chester-Ridley-Crum Watersheds Association, Anne Murphy, Executive Director, PA**  
 Citizens Against Resource Exploitation, "CARE" Andy Cheshier, Chairman, AK  
 Citizens Campaign for the Environment, Sarah Eckel, Policy Analyst, NY  
 Citizen's Coalition for a Safe Community, Paul V. Ferrazzi, Culver City, CA  
 Citizens for a Viable Easton, Robert Johnson, PA  
 Clean Water New York, Susan Chew, NY  
 Coalition for Responsible Growth & Resource Conservation, Anne Harris Katz, Secretary, PA  
 Comeback Farm, Mark Canright, Farmer/Owner, NJ  
 Community Environmental Defense Council, Inc., David Slottje, Executive Director, NY  
 Congregation Tzekek V Shalom of Newtown, PA  
 Corning/Elmira Past Regents Club, Mary Smith, NY  
 Court St Joseph #139, Mary Smith, NY  
 Crafts Creek Spring Hill Brook Watershed Association Inc., Bob Tallon, President, NJ  
 Croton Watershed Clean Water Coalition, Inc., Fay C. Muir, President, NY  
 Damascus Citizens for Sustainability, Barbara Arrindell, President, PA  
 Delaware County Neighbors, Caroline Martin, NY  
**Delaware Nature Society, Michael Riska, Executive Director, DE**  
**Delaware River Committee PA Trout Unlimited, Lee Hartman, Chairman PA**  
 Delaware River Greenway Partnership, Marion M. Kyde PhD, President, PA and NJ  
 Delaware Riverkeeper, Maya K. van Rossum, Delaware Riverkeeper Network, Tracy Carluccio  
 The Delco Alliance for Environmental Justice, Desire Grover, PA  
 Earthjustice, Deborah Goldberg, Managing Attorney, NY  
 EARTHWORKS Oil & Gas Accountability Project, Nadia Steinzor, Marcellus Reg. Organizer, Nat'l  
 The Energy Justice Network, Desire Grover, Youth & Community Organizer, PA  
 Environment America, Piper Crowell, National  
 Environment New Jersey, Matt Elliott, NJ  
 Environment New York, John Rumpler, NY  
 Environmental Advocates of NY, Katherine Nadeau, Water & Natural Resources Program Dir., NY  
**Friends of Holland Highlands, Mike Keady, President, NJ**  
**Friends of the Upper Delaware, Dan Plummer, Board Chair, NY**  
 GAS DRILLING AWARENESS FOR CORTLAND COUNTY, Sheila Cohen, NY



Grassroots Coalition, Patricia McPherson, President, CA  
 Great Egg Harbor Watershed Association Fred Akers, River Administrator, NJ  
 Greers Ferry Lake Gas Watch, Robert Finne, AK  
 Hunterdon Land Trust Alliance, Catherine Suttle, NJ  
 Ladies of Charity of Chemung County, Mary Smith, NY  
**League of Women Voters of Bucks County, Connie Borichevsky, Co-President, PA**  
 League of Women Voters of New Jersey, Nancy Hedinger, NJ  
**Lehigh-Pocono Committee of Concern, Nancy C. Tate, Staffperson, PA**  
 Maiden Creek Watershed Association, Elaine Bartholomew, President, PA  
 Media Green Drinks, Kathryn Garza, Founder, PA  
 Morris Co. Trust for Historic Preservation, Marion O. Harris, Chairman, NJ  
 Mountain Watershed Association, Beverly Braverman, Director, PA  
 Musconetcong Mountain Conservancy, Tom Koven, NJ  
 Natural Resources Defense Council, Kate Sinding, Senior Attorney, NY  
 NEPA Citizens in Action, James Luby, PA  
 New Jersey Conservation Foundation, Alison Mitchell, Policy Analyst, NJ  
 New Jersey Environmental Federation, David Pringle, Campaign Director, NJ  
 New Jersey Highlands Coalition, Julia Somers, Executive Director, NJ  
 New Jersey Sierra Club, Jeff Tittel, Director, NJ  
**New Jersey State Council Trout Unlimited, Rick Axt, Chair, NJ**  
 New York Residents Against Drilling, Kris Pixton, Co-Chair, NY  
 New York Trout Unlimited, Ron Urban, NY  
 New Yorkers for Sustainable Energy Solutions Statewide, Michael Lebron, Stan Scobie, NY  
 North East Group of Pa State Chapter of Sierra, Doug Heller, Chair, PA  
 NY/NJ Baykeeper, Deborah A. Mans, Baykeeper & Executive Director, NJ  
 NYH2O, Joe Levine, President, NY  
 NYS Church Women United, Mary Smith, NY  
 Otsego 2000, Inc., Nicole Dillingham, President Board of Directors, Cooperstown, NY  
 Otzinachson Regional Group of the Sierra Club, Jack D. Miller, Conservation Chair, PA  
**Peacemakers of Schoharie County, Katherine Hawkins, Spokesperson, NY**  
 PennEnvironment, Erika Staaf, PA  
 Pennsylvania Forest Coalition, Dick Martin, Coordinator, PA  
 People for a Healthy Environment, Inc., Doug Couchon, Board Member, NY  
 Perkiomen Valley Trout Unlimited, Christopher Ulmer, Secretary, PA  
**PhilaGreen Hospitality Association, Francine Cohen, Executive Director, PA**  
**Phillipsburg Riverview Organization, Reggie Regrut, Chairperson, NJ**  
**Pike Wayne Trout Unlimited #462, John Hart, President, PA**  
 Pomona Grange #1, Mary Smith, Chemung County, NY  
 Pompeston Creek Watershed Association, Debbie Lord, Vice President, NJ  
 Potter's Farm, Greg Hoak and Leah Zerbe, Farm owners, PA  
 Protecting Our Waters, Iris Marie Bloom, Director, PA  
**REALsmart, the League for Real Smart Growth, Mike King, Coordinator, NJ**  
 Sierra Club, Robin Mann, President, National  
 Sierra Club Rocky Mountain Chapter, Gopa' Ross, Oil and Gas Chair, CO  
 Sierra Club, Pennsylvania Chapter, Thomas Au, Conservation Chair, PA  
 Stony Brook-Millstone Watershed Association, Jim Waltman, Executive Director, NJ  
 Sullivan Area Citizens for Responsible Energy Development, Karen London, Co-Founder, NY  
 Sustainable Delco.org, Kathryn Garza, President, PA  
 The Coalition to Protect New York, Kate Bartholomew, CPNY Leadership Council, NY  
 The Lackawaxen River Conservancy, Winifred Olsen, President, PA  
 Theodore Gordon Flyfishers, Inc., John L. Barone, Vice-President of Conservation, NY



Town of Highland, Andrew Boyar, Supervisor, NY

Town of Highland, Debra R. Conway for Highland Concerned Citizens, NY

United for Action, David Braun, President, NY

Veteran Grange #1118, Mary Smith, Chemung County, NY

**Wayne/Susquehanna R.E.S.C.U.E., Joann Morsch, Secretary, PA**

Youghiogheny Riverkeeper, Krissy Kasserman, PA