



D.) Verbal Testimony on Oil, Gas, and Solution Mining Regulatory program

Verbal Comment of Delaware Riverkeeper Network

New York State Department of Environmental Conservation

Draft Scope of Draft Supplemental

Generic Environmental Impact Statement

on Oil, Gas, and Solution Mining Regulatory program

Well permit issuance for horizontal drilling and high-volume hydraulic fracturing to develop Marcellus Shale and other low-permeability gas reservoirs

Sullivan County, New York

December 4, 2008

Delaware Riverkeeper Network makes this comment on behalf of its 7000 members throughout the Delaware River Watershed from the headwaters of the River in New York State, through Pennsylvania, New Jersey and Delaware where the Delaware Bay meets the Atlantic Ocean 331 miles downstream. Delaware Riverkeeper Network considers the environmental changes that will accompany the natural gas industry here to have the potential to redefine the very nature of the Upper Watershed and, by extension, the entire Delaware River.

The arrival of the natural gas industry (perhaps more aptly named "industrial gas industry") may be the biggest, most far-reaching change to the River since New York City began building its water supply reservoirs in 1937, which allows the City to take a large percentage of the River's flow every day for its residents-making the City's growth and prosperity possible over the last 6 decades and supplying them with famously good tasting water.

Forces driving this industry go far beyond the region and are inextricably tied to economic, geopolitical and climate/energy factors rooted in global issues. Tonight, we're focusing on one critical piece of the puzzle here in the Delaware River Watershed -- the Department's attempt to assess and regulate

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Marcellus Shale natural gas development in New York through its Supplemental Generic Environmental Impact Statement (SGEIS).

We will be providing written comment that addresses the sections of the Draft SGEIS. Tonight we want to put on the public record the categories of concern that we see as the issues the Department needs to focus on for the SGEIS.

First, we think it is clear that more hearings are needed in order to solicit meaningful input from those who will be significantly affected by the outcome of this process. No hearing is being held in New York City or within the New York City Watershed that provides the water for 9 million residents there. The Delaware River and Catskill Reservoirs will be directly impacted by gas drilling within their drainage areas and yet they have no local hearing. There is also no hearing in the downstream receiving areas of the Delaware River; 7 million people rely on the Delaware River for water and they have no accessible location to speak their mind-that is wrong. Hearings need to be set in these locations and the comment period needs to be extended beyond December 15 for at least 30 to 60 days to accomplish a goal of broad public participation.

We agree that aspects of natural gas drilling, development and extraction require a new EIS and appreciate that the Department is updating the Final GEIS through this public process. The development and extraction procedures and scale of natural gas development in the Upper Delaware River Watershed are very different than the conventional industry practices the State has regulated up to this point. This new natural gas industry has transformative powers for our environment and, if the scope of development plays out as the industry predicts, nothing it touches will remain the same in our Watershed.

Broadly, we consider the areas of concern that need to be evaluated or re-evaluated in the SGEIS include water quality, water quantity, air quality and climate change, land use changes from temporary and permanent activities and facilities, stormwater runoff/nonpoint source pollution, wildlife, habitat and ecosystem changes, noise, light, and scenic pollution, community character and other cultural and historic changes, public health and environmental justice. Due to time constraints, we will focus in an abbreviated way on three of these significant areas: water quality, water quantity and stormwater runoff.

Water Quality - to assess and ultimately regulate to prevent damaging impacts to water quality, the Department will need to analyze the chemicals used in the hydraulic fracturing or "fracking" process. EPA's list of common fracking fluids and additives include liquid carbon dioxide, liquid nitrogen, crude oil, kerosene, and various lubricants, friction reducers, gels, surfactants, defoamers, biocides, polymers and proppants.[\[1\]](#) Further, a report submitted to Congress by an EPA whistleblower employee in 2004 revealed that acids, BTEX, formaldehyde, polyacrylamides, chromates, and other toxic substances may be introduced underground and to deep aquifers during fracking.[\[2\]](#) More chemicals that are harmful to human health have been revealed by pit testing[\[3\]](#) and examination of fracking fluids.[\[4\]](#)

Since the formulas used in fracking are kept secret and are considered trade secrets by contractors who perform this process, the Department will need to seek out not only the contents but the recipe of constituents in the additives to be used in each well in order to assess what pollutants may be introduced to the environment. This will require testing and recording of the fluids before mixing with water. This information should be publicly posted on a State website for easy access by all.

The opportunities for natural gas wastewater to pollute the environment are multiple. Drilling and fracking processes introduce chemicals into the well bore with an estimated 20 to 60% of the fluid remaining underground and the high pressure process also disturbs, distributes, and brings to the surface chemicals/minerals from various rock formations (such as salts, sulfides, and "normally occurring radioactive materials" or NORMS in the "produced water" or "flowback"; NORMS have required decontamination elsewhere such as at 140 sites since January 2005 in Texas in Barnett Shale)[\[5\]](#). The Department of Energy has found that flowback from natural gas operations are about 10 times more toxic than those from offshore oil wells.[\[6\]](#) USGS also reports that natural gas condensates may also contain the chemicals known as "BTEX".[\[7\]](#)

The storage of the fracking fluids and flowback in open pits and the action of the well development process exposes the chemical mix to the land surface, which provides another pollution pathway to groundwater through infiltration, to surface water through overland flow and deposition on water from the air volatilization of chemicals.

While the Department maintains that casing requirements keep the frack fluid and groundwater separate, the fact is there are instances of pollution to well water in other regions by natural gas wells. It is not good enough to promise that casing will prevent such incidents-casings are required in these other areas. Some occurrences are accidents and strict requirements for secondary containment, adequate runoff collection and disposal, and testing of materials used are essential to prevent these and should be required by the Department. For example, a recent incident reported in Newsweek recounted a fracturing fluid spill that sent a worker to the hospital and is being investigated as the cause of his nurse's near death illness[\[8\]](#).

But pollution also occurs due to mixing of natural gas/gas products with groundwater. An incident of methane from a gas well leaking into 43 water wells has been reported in Ohio, ruining private wells and requiring water to be imported for the neighborhood.[\[9\]](#) Other incidents of pollution near natural gas wells include water wells in the Pinedale Anticline, a natural gas rich area in Wyoming where six wells are emitting potentially flammable gas in such high levels that they can't be safely tested[\[10\]](#) and also in Wyoming where hydrocarbons have been found in a water well for livestock[\[11\]](#). The Department needs to consider all the pathways of pollution open to fracking fluids, wastewater, hydrocarbons and other materials used and gas/gas products in the SGEIS and to learn from these incidents even if conditions are not exactly the same because much of the well construction and development is similar.

In the Scoping document, it is stated that the Department has "no record of documented instance of groundwater contamination" but we ask: Have you looked? The answer is no. Presently monitoring wells and continuous well water monitoring is not required by the State when a gas or oil drilling permit is issued. Further, there are documented instances of water well pollution near gas wells but because no water well and aquifer testing is required before gas well construction, it is nearly impossible to prove causation. The Department needs to require pre and post water well testing within the zone of influence of all natural gas and oil wells and require monitoring wells to be installed and regularly tested and reported as a permit condition. Otherwise, pollution will go undetected and polluters will never be identified or accountable.

Water Quality will be impacted by the discharge of wastewater from the industry. We have only to look next door in Pennsylvania to find out how. The discharge of wastewater from gas development in the Marcellus shale has contributed to a currently unfolding contamination emergency for the

Monongahela River. PADEP is investigating unusually high levels of total dissolved solids (TDS) in the river that has affected 11 public water supplies that serve 325,000 customers.

TDS represents the dissolved elements in water and can include carbonates, chlorides, sulfates, nitrates, sodium, potassium, calcium and magnesium and causes water to be discolored and of poor taste.^[12] PADEP issued a water quality advisory for consumers to use bottled water until the problem is addressed and has had to all but ban the acceptance of wastewater from gas well fracking by local sewage treatment plants (requiring reduction of gas drilling wastewater to 1% of the daily sewage flow-some plants were taking in as much as 20%).^[13] Water treatment facilities are not equipped to remove the TDS that has fouled the Monongahela River.

The same thing will happen in New York if the Department does not require the treatment and proper disposal of natural gas wastewater at facilities that can process it - and sewage treatment plants cannot. In fact, until the Department is certain that adequate treatment facilities exist to process this wastewater to clean water standards, no drilling permits should be issued.

The passing through of diluted wastewater from gas well development, like the practice in Pennsylvania that has proven so harmful, disperses the pollution further and spreads health hazards to more communities, threatening receiving waterways and all the communities there and downstream.

All toxic substances must be removed from wastewater before effluent is discharged in order to protect surface water quality and designated uses. DRN sees this issue as extremely far reaching since it can impact millions who draw drinking water from the Delaware River and its tributaries downstream; communities who are not connected to gas drilling and cannot collect lease or royalty monies will be forced to pay the price of water supply contamination if New York does not require decontamination of all gas wastewater.

The Department states in the Draft Scope that it will consider injection of wastewater into the ground as a disposal option. For the record, we do not consider injection of wastewater underground to be a solution; injection simply moves the pollution problem to another place and time. Geologists have long opined that future generations may have to rely on the ancient waters that lie deep below the surface for water supply - can we afford to jeopardize that water supply? We also consider the risk of pollution too great to allow open pits to be used on natural gas well sites. We advocate for all fluids and wastewater to be contained on site in containers, fitted with air vent filters to capture pollution; open pits should be outlawed.

Water Supply - It takes between 2 and 9 million gallons of water to frack a well in the Marcellus Shale.^[14] Amounts vary, depending on equipment, site specific conditions, the number of times the well is fracked, and the depth of the well.^[15] The first water supply permit application has been filed in the Delaware River Watershed on the East Branch in New York and well permit applications have been filed as well, all by Chesapeake Gas Co. This is the beginning of what could be, if industry forecasts hold in terms of the amount of gas to be extracted from New York's Marcellus Shale (estimated to be 50 to 200 Tcf), the largest consumptive and depletive water use in New York outside of the City's daily withdrawal from the Delaware River/Catskill reservoirs.

Potential impacts include aquifer depletion, stream flow depletion and disruption of natural flow regime, interference with hydroperiod flow to wetlands and other water dependent ecosystems. In turn, aquatic life, fish, wildlife and plant life can be affected. Drinking water supply can be depleted. In addition to the volume of water used in fracking, typically water is "produced" by the gas well when fluids and gas rise to the surface, carrying water from the aquifer. This produced water is considered an additional depletive loss; the black Devonian shale that holds the Marcellus formation is known to produce higher quantities of water than some other natural gas geologies.[\[16\]](#)

Further, wastewater will likely be discharged away from the subwatershed it was drawn from, pushing small subwatersheds towards deficit. Due to the large amount of water used and lost in natural gas extraction and its removal from the natural system, over time continual withdrawals could undo the resource's ability to replenish; this is true for surface water and groundwater withdrawals.

The Department has to conduct a build-out analysis to assess the total amount of water that will be used and depleted, not only daily but over time. That build out analysis should reflect a defined period of time as a planning horizon (such as 10 or 20 years) and calculate the impact on streams and the Delaware River -- as well as the reservoirs - of the lost water. The impacts should be measured not only by stream flow needed to meet allocated uses and protect drinking water quality - though this is critically important and water withdrawals should only be allowed on gauged streams where actual base flow data is available from entities such as U.S. Geologic Survey - but also by the impacts on the ecological needs of the stream, as measured by fish, aquatic life and biota (critters at the base of the web of life), plants and features such as wetlands.

It is essential that the Department gather available data that will become the baseline against which the projected build-out quantities can be measured on a subwatershed basis; the location of withdrawals is key because of the very real possibility of depleting a small stream and/or aquifer in the headwater-rich Upper Delaware Watershed. Rivers and streams in Pennsylvania are being continuously pumped, and some have been sucked dry for natural gas fracking.[\[17\]](#) How is New York going to prevent the same thing from happening here? Only through knowing what we have and then regulating to protect it. We cannot sacrifice water for gas.

Tracking how much water is actually used from waterways must be monitored at the expense of the user with meters and stream flow must be measured with gauges during withdrawals; direct computer hookups can be used to relay this data on a real-time basis to the Department and to a publicly viewable portal; these types of systems are in place already at agencies such as USGS and the DRBC; the Department should modernize its monitoring system to match what other agencies are doing in order to retrieve this valuable information.

Continuous recording devices must be installed at the permittee's expense in monitoring wells to measure static water levels over time. The Department can then monitor the long term impacts of groundwater withdrawals and groundwater recharge reduction. This information is important for individual permits but also essential to protect and plan water supply resources locally and regionally.

Complicating the natural system here is the fact that the Delaware River Watershed States and New York City have agreed under a Supreme Court Decree to maintain a flow target at Hancock in order

to meet Philadelphia, New Jersey and other downriver water supply needs - a fact that Chesapeake will run head on into very quickly with its poorly located East Branch application. The Department must be aware as it assesses water resource impacts that the Delaware River is part of four states, all which lay claim to portions of those resources through decades of argument, litigation, negotiation, and agreement. The water wars of the Delaware River have laid out a complex and litigious playing field for any newcomer who has designs on its flow.

Stormwater Runoff and Nonpoint Source Pollution - The Department needs to reevaluate stormwater management for gas well extraction. The Marcellus Shale will result in multiple well bores on each pad, intensifying the construction and well development activity on each pad as the land changes to urban condition and the road and feeder pipeline are installed. Further, stormwater control best management practices will need to reflect the types of nonpoint source pollution that will accompany this industrial construction which relies on machinery fueled by diesel and requires a lot of traffic with heavy machinery and trucks, such as 4,000 to 5,000 gallon tank trucks that carry the water in and out (thousands of trips per frack per well).

The required clearing of vegetation, leveling and soil compaction for the pad, access road, and pipeline, the installation of temporary and permanent equipment, and the intense use of the site for drilling, fracking and development, extraction and then finally, production, processing and delivery of natural gas off site add up to significant levels of disturbance, changed runoff volume and velocity and pollution.

The Department should require individual stormwater permits for each well cluster in order to provide adequate erosion and sedimentation controls during construction, with special consideration for buffer areas to critical habitats, streams, wetlands and vernal pools, and water supplies. Also, the Department should calculate the earth disturbance based on the ultimate land to be cleared for the total build out of the well cluster, not on how much land is disturbed at one time, like Pennsylvania DEP does for its General Stormwater permit^[18] for gas and oil wells, newly adopted this year. When active well development is complete on a site, permanent stormwater best management practices, including revegetation and forest restoration with native vegetation, must be required.

What the Department does not cover with its permitting, needs to be regulated by the municipality which, under NPDES 2 is responsible for controlling runoff and nonpoint source pollution under municipal General Permits^[19]. Unfortunately, in Pennsylvania, the natural gas industry is challenging the municipality's right to this control; it is presently before the Pennsylvania Supreme Court.

The Department needs to lay out very clearly in its SGEIS the who's and what's of stormwater controls from the first spade of earth disturbed to the ultimate build out of permanent infrastructure. The lack of effective stormwater management for Marcellus Shale gas wells will destroy soils, increase erosion and sedimentation to water bodies, cause flooding, reduce healthy groundwater recharge and stream base flow, pollute and turn our streams into ditches that can't support life.

The Watershed - The Draft Scope references the Upper Delaware River Wild and Scenic Corridor. But it is not just a Corridor. The Upper Delaware River is a Wild and Scenic River with a inextricably connected Watershed blessed with vast expanses of unbroken forest, agriculture, rural landscapes,

trout streams, historic settlements and towns. Even if the Department were to address water quality, water quantity and stormwater issues, and the myriad of other issues involved, the scale of natural gas development that is aspired to by the industry is staggering in its implications for these unique and outstanding values. We point out that some of these areas are simply too vulnerable and irreplaceable to allow any gas drilling—such as floodplains and riparian areas, wetlands and buffers, threatened and endangered species critical habitat, water supply reservoir and lake drainage areas such as New York City's impoundments, public parks such as Catskill Park, wellheads, and deep forest. These areas must be designated as "No Drill" areas in order to protect them; exposing these outstanding values to degradation is an unacceptable risk.

In the SGEIS, the Department must look at the cumulative and full build out impacts of the well fields with all possible in-fill development and with pipeline, compressor stations and other permanent infrastructure in place, no matter if another agency has permitting power for some facilities. In order to assess these impacts the Department must gather and/or develop baseline data about the natural features which makes up the Upper Delaware River Watershed and the southern tier of New York. Otherwise, there will be no way to measure the impact of what is about to happen here.

This assessment needs to be part of the SGEIS process and needs to inform the decisions about how to regulate natural gas development here. It must be recognized that the magnitude of the activity requires the Department to consider the SGEIS not only on an individual permit basis but also to consider natural gas extraction, development and delivery as a consolidated project that will amass impacts as it builds out and, as an industry, will affect all we have as a supergiant project with a huge footprint on the Upper Delaware River Watershed.

The Draft Scope is filled with assumptions, wrong assumptions, upon which the Department is relying. Incorrect water volumes are assumed for the fracking process, the use of fresh water for fracking is assumed when assessing pollution risks of frack water but the Department says they are considering using sewage effluent, cooling water, "saline aquifers", and recycled frack water instead of fresh water. Assumptions fill page after page in the Draft Scope and include: that all "low permeability shales" will have the same properties as Marcellus Shale; that historic statistics of well development can forecast the Marcellus Shale well development pace; that old and present technologies and practices will continue to be used by the industry; that hydraulic fracturing is a controllable technique in fractured shale and therefore will never open cracks into water-bearing aquifers; that flowback and hydrofrack fluids are never mixed and both will be confined from the environment and that the wastewater will not be held on site for an appreciable period of time; that there are no solids or sludge to be disposed of from the gas well development process; that the number of long-term production sites and the acreage per well disturbance will be less for Marcellus Shale due to multiple wells on each pad and that this will reduce the number of wells per square mile; that NORMs are the only contaminants in flowback fluids that are dangerous and pose a human health threat; that a gas well is a closed system (in terms of air emissions) during production phase; that precipitation always exceeds evaporation in this region; that existing data regarding habitats for endangered, rare and threatened species is adequate; that companies will always have a limited number of drilling rigs and personnel that will reduce the cumulative impacts; that water withdrawals will be non-continuous into the future; that community impacts will be temporary; that many areas of concern that were addressed in the 1992 GEIS were adequately assessed and do not need to be revisited; and more.

Given these incorrect assumptions and the lack of discussion of standards of review and exactly how the assessment will be performed, we suggest and join with our colleagues in stating that the Department should consider all public comment and then return to the public arena with a second Draft Scope that removes these wrong assumptions and examines in more depth the issues to be re-examined and how they will be evaluated and then, ultimately addressed through regulation. In other words, we advocate that the Department start fresh after all public comment is evaluated and re-issue the Draft Scope for further public consideration.

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[16] U.S. Dept. of Energy, Argonne National Laboratory, "A White Paper Describing Produced Water from Production of Crude Oil, Natural Gas, and Coal Bed Methane", January 2004, page 17.

[17] <http://www.thepittsburghchannel.com/news/17973811/detail.html>

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[19] <http://www.epa.gov/npdes/pubs/fact1-0.pdf>