



December 30, 2009

DSGEIS Comments  
Bureau of Oil & Gas Regulation  
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**Re: Re: Draft Supplemental Generic Environmental Impact Statement on the Oil, Gas, and Solution Mining Regulatory Program (the "Draft")**

Delaware Riverkeeper Network (DRN) submits these comments on behalf of our members in New York and throughout the Delaware River Watershed and to serve and further our mission of defending and restoring the Delaware River and its Watershed, tributaries and habitats.

DRN respectfully requests that New York State Department of Environmental Conservation (NYSDEC) withdraw the Draft due to the inherent deficiencies in the document and its failure to address the fundamental issues that led to the requirement of a supplemental GEIS.

DRN delivered verbal comments at DEC's October 28, 2009 Hearing, signed on to comments submitted by New Jersey organizations on December 29, 2009, and signed on to technical comments on the DSGEIS prepared by experts retained by NRDC, Earthjustice, Riverkeeper, Inc., and Catskill Mountainkeeper on December 30, 2009. The herein comments supplement those comments. DRN submitted lengthy comments on the Draft Scope last year and signed on to substantive group comments submitted regarding the Scope on December 15, 2008. Few if any of our concerns and suggestions that we submitted in our Scope Comments were addressed in the final Draft.

**Comprehensive Analysis of Cumulative Impacts and Lack of Regulation:** The Draft states that cumulative impacts are too "inherently difficult" to assess (DSGEIS 6-143). However, due to the lack of cumulative analysis, the adverse impacts of the build-out of shale gas development in New York State cannot be measured. Without this measure, the mitigation and permit conditions that are offered in the Draft are not acceptable because the full impacts are not considered. This is the first fatal flaw in the Draft.

Why is this basic task too difficult? We suggest that it is because of DEC's failing to identify fully the adverse impacts that need to be addressed. Without identifying the problems, DEC

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cannot assess the possible negative impacts on a site-specific and individual property basis nor on a cumulative basis. It follows that DEC cannot, in turn, develop regulations to prevent these impacts or mitigate harms.

This brings us to the second fatal flaw in the Draft, the lack of any proposed regulations or changes to existing rules. DEC assumes that major impacts are addressed in the original GEIS and existing rules spread out among various state programs cover all major issues; any new challenges they say can be addressed through individual permit conditions. This is a wrong assumption due to the intrinsic hazards of hydraulic fracturing and horizontal drilling in the deep formations of Marcellus shale, which were not considered in the GEIS.

The Draft does enumerate several differences between modern shale gas development and previously assessed natural gas development but then goes on to discount the hazards by skirting the enormity of the risks involved. The intensity of well pad development, the potential air impacts from wells and open pits, the handling of millions of pounds of chemicals for hydraulic fracturing on a daily basis throughout the Marcellus and Utica shale regions, the production and required disposal of highly polluted flowback fluids from the well bores, the drastic changes in land use and land cover, and the proximity of these activities to water supplies and groundwater, are all dismissed as issues that were addressed to some extent in the GEIS or that can be addressed on a site by site basis with a few permit conditions or through other regulatory programs.

And pipelines are deliberately segmented off from any consideration in the Draft because of existing regulatory processes. This removes from the equation needed analysis of the full impacts of shale gas development—a myriad of pipelines and gathering lines, small feeder lines, and processing and storage facilities are all being constructed across the State and into other states to carry shale gas to market. Yet these impacts are not considered.

Further, noise, light, smells, vibrations, traffic, and community impacts go unaddressed as manageable but on a cumulative basis, as well as very locally, these impacts can be overwhelming to the environment and to humans and wildlife.

Nowhere are the many adverse impacts of these activities listed above fully analyzed in light of current experience (such as the numerous management problems that have led to chronic and/or catastrophic pollution incidents in Pennsylvania and West Virginia), analyzed from the worst case scenario as they are obliged to be, or cumulatively considered based on the typical build out of gas fields.

The lack of cumulative analysis, even where such a build-out scenario is not that difficult (such as land to be converted from natural land cover to impervious surfaces by full build out of gas wells at projected spacing, or the amount of fresh water needed to hydraulically fracture all developed wells in the Marcellus and Utica fairways in New York, or the amount of produced wastewater that will need to be treated and the technologies needed to accomplish treatment) is a failing in the Draft that argues for the withdrawal of the document until such an analysis can be completed for all aspects of shale gas development.

**Protection of Delaware River Watershed Water Supplies:** The decisions that New York State makes regarding the management and regulation of the development of natural gas from the Marcellus shale and other similar formations in the Upper Delaware River Watershed has the potential to affect the water resources of the Delaware River Basin. This has been

determined by the Delaware River Basin Commission in its Executive Director Determination issued May 19, 2009 (<http://www.state.nj.us/drbc/naturalgas.htm> ).

This has also been determined by New York City Department of Environmental Protection (NYCDEP) in its comments and Final Impact Assessment Reports issued Dec. 23, 2009 ([NYCDEP's comments on the dSGEIS \(PDF\)](#) and [Final Impact Assessment Report \(PDF\)](#) ). NYCDEP is calling for a prohibition on drilling in New York City's reservoir watershed that supplies 9 million New Yorkers with their water supply and has requested that NY DEC rescind the Draft SGEIS to address the City's concerns ([Cover letter for comments on the dSGEIS \(PDF\)](#)). Acting NYCDEP Commissioner Steven W. Lawitts commented that "...high-volume hydrofracking and horizontal drilling pose unacceptable threats to the unfiltered fresh water supply of nine million New Yorkers." (NYCDEP press release, "Department of Environmental Protection Calls for Prohibition on Drilling in the New York City Watershed", Dec. 23, 2009).

Three major dams form NYC's reservoirs in the headwaters of the river in NY State, carrying up to 800 mgd per day to up to 9 million people in New York City, a depletive use outside of the Watershed. This translates into a loss of Delaware River water from the Watershed currently of about 292 billion gallons total per year, the largest single use of river water, and means that NY State is the largest consumer of Delaware River water, even though it is the second to smallest state in terms of Watershed land mass.

The New York reservoir watershed can arguably be considered the most influential factor in the River's flow, controlling about 28% of it. The total 650 billion gallons of water used per year by all River water users means that the Delaware River is required to provide more than 5% of the U.S. population with water even though it represents only 0.4% of the US land area (<http://www.state.nj.us/drbc/thedrb.htm> ). The Delaware River, it can be said, is already heavily utilized (and exported) before it even leaves New York State, making reliable quantities of fresh water to downstream water users all the more critical.

The water supply demands placed on the natural Delaware River are a perennial strain and over history the growth of the New York-Philadelphia Metropolitan region required the intervention of politics and the Courts to keep the needs met and the managed system functioning. From the settlement of Bethlehem in 1754 when the first public water supply system was built (R.C. Albert, [Damming the Delaware, The Rise and Fall of Tocks Island Dam](#), 1987, second edition 2005) to decades of legal and institutional arguments to the present wrangling that has birthed the Delaware River Basin Commission's (DRBC) controversial Flexible Flow Management Plan (FFMP), the River has been forced to perform day in and day out, year in and year out.

This Herculean task is a precarious balancing act that is by no means completely predictable and certainly not totally controllable. Through the application of technology and the "plumbing works" of the dams, the Parties to the Supreme Court Decree that settled the water arguments between the states in 1956 manage to meet required flow maintenance targets that are meant to protect the uses that the River fulfills from the Upper River to the Bay.

Besides delivering water to NYC, the reservoirs during dry times add water to the main stem river to maintain flows to meet these withdrawal demands and the needs of downstream aquatic life and recreational uses ("conservation releases"). Fresh water releases from New York's reservoirs and other basin reservoirs allow minimum flow targets to be met downstream (Montague and Trenton) all the way to the estuary where the goal is to provide dilution for

assimilation of discharges and to keep the salt line from spoiling the drinking water supply for Philadelphia (DRBC, "Water Supply Reservoirs and Flood Protection", 12.13.07, page 3) and New Jersey American Water Company. Conservation releases from the reservoirs are supposed to provide flow and temperature moderation in the streams below the dams in an attempt (often not successful) to protect fish and aquatic life.

And unfortunately, the possibility of drought is always present and has to be figured into the planning. Drought conditions can develop quickly within a season. DRBC points out that in 2001, the season began with 100% full, spilling reservoirs (holding 271 billion gallons of water) but less than 8 months later, the reservoirs were at 23.4% of capacity, holding just 63.348 billion gallons combined - it took until spring 2003 to refill. There have been 11 droughts managed by the DRBC since 1980 (DRBC, "Water Supply Reservoirs and Flood Protection", 12.13.07, page 3). The threat of drought is exacerbated by global climate change which translates into weather instability and further unpredictability.

Further complicating flow issues is the ongoing development of a flow regime by the Supreme Court Decree parties that will undergo public rulemaking by the DRBC. Tremendous time and expense has been invested over the years and is continuing to be invested currently in the development of a river flow regime that both protects downstream water supplies and the living resources of the river, such as fish and aquatic life. The Parties are in the process of developing a Flexible Flow Management Plan (FFMP) for the Delaware River (<http://www.state.nj.us/drbc/FFMP/index.htm> ).

New Amendments to the Commission's Water Code are being developed after previously proposed amendments (published December 2007) were withdrawn in December 2008, amidst much public controversy; complaints about the poor performance of the FFMP regime in regard to fish protection by the PA Fish and Boat Commission were key in having the proposed plan withdrawn (Letter to PA DEP from PA Fish and Boat Commission dated 9.19.08). The new rulemaking process is ongoing; several studies and analyses are being conducted by Commission committees, subcommittees and staff.

In the interim while the FFMP studies are being developed, the Parties (States of New York, Pennsylvania, New Jersey, Delaware and City of New York) put in place a management plan for releases from the New York City reservoirs. Most recently, the Decree Parties announced changes to the FFMP ([http://water.usgs.gov/osw/odrm/documents/Temporary\\_2009\\_Summertime\\_Releases\\_Agreement\\_Final\\_Approved.pdf](http://water.usgs.gov/osw/odrm/documents/Temporary_2009_Summertime_Releases_Agreement_Final_Approved.pdf)) in June for the period June 1, 2009 to May 31, 2010.

The changes were aimed at improving downstream habitat by additional release of cold water to reduce thermal stress on fish in the upper reaches of the river for most of this season. An "Extraordinary Needs Bank" was also established to hold water for other needs that may arise. Also New York City was allowed more flexibility in reservoir operations to try to reduce the rapid fluctuations of releases which can cause havoc on downstream aquatic life. State fishery experts and technical review of the effects of the FFMP over the past season led to the changes.

Even with these recent changes, the FFMP is still considered flawed by many; conservationists argue that if the actual diversion quantities used by NYC were to be used to set the release program there would be more water that could be released to benefit the fishery downstream

of Cannonsville (on the West Branch) and Pepacton (on the East Branch) Reservoirs (Statement to RFAC and DRBC, Peter Kolesar and James Serio, June 17, 2009).

These recent events regarding the FFMP illustrate the level of involvement and the technical complexities of flow management in the Delaware River, particularly the Upper Delaware main stem and the upper tributaries, the very areas where Marcellus Shale is located, where shale gas drilling will occur and where water withdrawals will be needed for drilling.

Approximately 36% of the Delaware River watershed is underlain by Marcellus shale; 18,700 square miles of New York is within the Marcellus shale fairway. Although there are no horizontal shale wells in the Delaware River Watershed yet, there is an application pending before the DRBC for a water withdrawal of .75 mgd from the West Branch of the Lackawaxen River, a tributary to the Upper Delaware, and several well applications have been filed with NYDEC in New York State and PADEP in Pennsylvania for the Upper Delaware River region. It is estimated that approximately 200,000 acres of land in the Upper Delaware River Watershed has already been leased for new gas wells.

At least 15 million people rely on the Delaware River for water supply. The exceptional quality of the Upper Delaware's headwaters sustains the 8 million residents who drink from the Delaware as far south as Trenton and South Jersey, Philadelphia and Delaware State. This includes approximately one third of the population of New Jersey, the entire eastern portion of Pennsylvania with major withdrawals along the main stem for the City of Easton, the Forest Park Water Treatment Plant, Morrisville, Lower Bucks County Joint Municipal Authority, Aqua Pennsylvania, and about 310 mgd from the Delaware River Watershed for the City of Philadelphia.

Even the State of Delaware's major source of water supply is impacted by Delaware River flows because the major intake, on a fresh water tributary, is tidally influenced by flows from the main stem Delaware River and Delaware's industrial supplies, which are drawn from the estuary, are important economically as are many of the other state's industrial withdrawals from the river, estuary and Bay that could be impacted by substantial water quality and flow changes.

The City of Philadelphia withdraws an average of 200 mgd from the main stem Delaware, serving about 60% of their water users, with the other 40% coming from the Delaware's main tributary, the Schuylkill River, whose headwaters in Pennsylvania are also underlain by Marcellus shale. Approximately 1.5 million Philadelphia residents are served by the City's water system which, as the largest southern downstream intake, is constantly struggling with keeping its water from becoming too saline. This water supply would be directly impacted by high Total Dissolved Solids (TDS), chlorides, and sulfates from upstream discharges of gas drilling wastewater, making the potability balancing act even more difficult.

Also a problem is the presence of bromide in gas drilling wastewater since chlorine, which the City uses to disinfect its supply, reacts with bromides to cause bromates and other brominated disinfection byproducts (DBPs) which are known health hazards, such as trihalomethanes. Some trihalomethanes, THMs, are carcinogenic (Trihalomethanes in Drinking Water: Sampling, Analysis, Monitoring and Compliance, EPA Number: 570983002). The use of ozone as a disinfectant also creates very dangerous byproduct contaminants, a water supplier's nightmare.

In New Jersey, it is estimated that 2,833,832 residents drink water from the Delaware River, which is about 1/3 of the total population of the State. Four major intakes on the main stem river supply surface water. The intake farthest south in New Jersey, 100 million gallons per day by New Jersey American, is located across from Philadelphia's Baxter Plant and is subject to the same difficulties in balancing fresh and tidal waters. This intake provides water for one million South Jersey residents. It is located in the area of the Potomac-Raritan-Magothy aquifer, which due to over-allocation of well water had developed a cone of depression that caused river water to intrude into the groundwater system, increasing chloride levels above the portability standard of 250 mg/L (<http://pubs.usgs.gov/sir/2004/5096/>).

This saltwater intrusion problem led NJ Department of Environmental Protection (NJDEP) to declare the region a Critical Water Supply Area (one of two areas in the State), where excessive water use poses significant threat to the long-term integrity of water supply sources. The New Jersey American surface water intake is a crucial water supply that has allowed groundwater use from the Potomac-Raritan-Magothy aquifer to be reduced, reducing salt water intrusion into the aquifer from the tidal river in the Burlington, Camden, Gloucester, Atlantic, Cumberland, Salem, Monmouth and Ocean County region ([http://www.state.nj.us/dep/localgov/water\\_allocation.html](http://www.state.nj.us/dep/localgov/water_allocation.html)).

These downstream water supplies are already vulnerable to degradation and are carefully managed by the release of reservoir waters as discussed above. In addition to the New York City reservoirs, the Merrill Creek Reservoir in New Jersey and reservoirs in Pennsylvania are used to supplement river flows on an as-needed basis due to the delicate balancing of water uses and wastewater and nonpoint source pollution inputs at a cost of billions of dollars in public and private investment over the decades.

The reduction of upstream clean fresh water and the input of wastewater from gas drilling as well as the overland and nonpoint source pollution of upstream waters by gas drilling and its accompanying industrial land use and practices all have the potential to substantially adversely impact these vulnerable and highly managed downstream water supplies. Since shale gas extraction methods require the use of between 2 and 9 million gallons of water for each well to be hydraulically fractured (on average, 4.5 million gallons), and since it is estimated that at least 200,000 acres of land are already under lease to gas companies in the Upper Delaware River Watershed alone (and much more land is expected to be leased), many thousands of wells are expected to be drilled there (many of them in New York State), translating into billions of gallons of fresh water that will be consumed over the coming years (the water is not returned to the source, it is a depletive loss; approximately 25% on average stays in the ground after well development and the rest is either trucked away for disposal or re-used). Estimates of the length of time that shale wells will be drilled, developed and used in Marcellus and Utica shale formations range from 50 to 100 years.

The less volume of fresh, high quality water that is available to assimilate upstream discharges and nonpoint source pollution to the river, the more difficult it will be for suppliers to meet established water quality standards. Additionally, costs associated with treatment will escalate if water quality is degraded by upstream inputs, unfairly burdening downstream water users. Those dangerous pollutants that are not removed either by waste treatment technologies or water treatment systems or prevented through land use controls or alternative technologies, will adversely impact the health of the residents who drink the water from the Delaware and will increase costs and operational systems for industrial and commercial users.



The potential for degradation is very high and the cost borne by those downstream will amount to an unfunded mandate without any recompense. The Draft does not contemplate these impacts at all; there is not even a mention of downstream water source impacts, much less any analysis of the magnitude of these impacts or alternative approaches to avoid degradation or mitigation of harm. This lack of consideration of these impacts argues for the withdrawal of the Draft until such an analysis can be completed for all aspects of shale gas development.

**Water Quality Impacts:** The Draft identifies hydraulic fracturing and horizontal drilling as necessary practices in shale gas development and production. Both hydraulic fracturing and horizontal drilling pose water quality problems yet the Draft does not address or fully explore these impacts. These practices involve the importation, handling, mixing and injection into a well bore of tons of chemicals through hydraulic fracturing. Additionally, drilling itself requires muds that contain chemicals as the drill bit bore down and horizontally through the earth.

The bore is drilled through fresh water aquifers, past deep ancient aquifers, and into deep geologic formations, often a mile or more deep and a mile or more horizontally to maximize penetration into the shale. The result is lengthy exposure to these deep formations which increases the opportunity for deep geology pollutants to seep into the well bore during and after well development processes, bringing these dangerous contaminants up through shallow aquifers and to the surface.

Despite casings and other precautions, groundwater pollution incidents do occur and can occur in shale gas well development, as explained in NYCDEP's Final Impact Assessment Report and Rapid Impact Assessment (New York City Department of Environmental Protection, "Rapid Impact Assessment Report, Impacts Assessment of Natural gas Production in the New York City Watershed", September 2009, 3.4.1).

On average, approximately 25% of the fluids injected into the well bore remain underground with their fate unknown and their disposition unregulated, a depletive loss. The migration of this chemical mix from the fractured gas well into other formations and fissures, sometimes even brought to the surface over time, is possible and can occur ([Cover letter for comments on the dSGEIS \(PDF\)](#)) but is not fully explored as an outcome by DEC (DSGEIS, Appendix 11). This is an error and needs to be fully considered and analyzed by DEC in a new SGEIS.

**Hydraulic fracturing** needs to be regulated and alternatives to its use must be considered. The DSGEIS lists 12 classes of additives that make up fracturing fluid products and reports that nearly 200 products could be used in New York for fracturing the Marcellus shale (DSGEIS, 5-45). 260 "unique chemicals" that are contained in these products are listed in the Draft and another 40 compounds in use were identified by companies but the ingredients were not disclosed (DSGEIS, 5-35). Extensive information is provided about the chemicals that could be used and health information about the dangers of exposure from the NY State Department of Health is included (DSGEIS, 5-62-66).

Regardless, DEC concludes that these chemicals can be used safely through certain management efforts; no chemicals are banned or considered too dangerous to inject into the well bore, despite the hazardous nature of many of them and the unknown effectiveness of pollution prevention plans in regard to the extremely dangerous chemicals that are involved—benzene and benzene derivatives, kerosene, formaldehyde, ethylene glycol, ethylene oxide, naphthalene, methanol, xylene, butanol, acids, and some ingredients EPA classifies as "acutely hazardous".

A cumulative analysis of the use (and possible recycling) of these fluids needs to be prepared by DEC in order to understand the full impact of the use of these chemicals on water resources. Table 4-2 from NYCDEP's [Final Impact Assessment Report \(PDF\)](#) shows cumulative impacts of refracturing on water, wastewater, and chemical volumes. DEC needs to prepare such an analysis for the entire Marcellus and Utica shale fairways in New York State.

And further analysis by NY's Department of Health is not required by the Draft, leaving unanswered many questions raised by this voluminous list and the 40 undisclosed compounds that the industry says they use. NY Department of Health should commence immediately a Health Impact Assessment as part of the SGEIS, along the lines of the assessment being conducted in Colorado as part of the Garfield County EIS (Witter, et al, "Potential Exposure-Related Human Health Effects of Oil and Gas Development: A White Paper", Colorado State University, University of Colorado, page1 and 21).

When it comes to protecting drinking water, a precautionary approach is required and justifiable. There are "green fracturing fluids" in use elsewhere in off-shore oil drilling that need to be investigated and the potential impacts of using non-toxic materials for fracturing must be seriously explored.

Attached as Appendix A is a list of chemicals provided by Chesapeake Appalachia Gas Co. as fracturing fluid ingredients they may use in shale wells they develop in the Upper Delaware River Watershed in New York State. This list was obtained by DRN from the DRBC through a Freedom of Information Act request regarding well permit applications submitted by the company to NY DEC. Many additives contain chemical hazards, toxic, known or suspected carcinogens, known or suspected endocrine disruptors, and/or are harmful to human health, fish, aquatic life, wildlife, or ecosystem health. These are the chemicals we can expect to be used in shale gas development in New York State and the Upper Delaware River Watershed. DEC needs to specifically analyze and assess the risks of these known chemicals as well as those listed in the Draft.

**Flowback or "produced water"** requires treatment as a wastewater under the Clean Water Act before it can be discharged to the environment (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 25). Flowback erupts to the surface after hydraulic fracturing and is usually mixed with used fracturing fluids and stored on the well site in open pits.

The Draft recognizes that flowback produced by the gas well after hydraulic fracturing and well development contains pollutants from the deep geology and discusses the constituents of the wastewater in detail in Chapter 5 (DSGEIS Tables 5-8 and 5-9). For instance, aromatic hydrocarbons such as BTEX, which includes benzene, is documented as being among some samples of flowback from PA and WVA (DSGEIS 5-109). Benzene is a known carcinogen and USEPA has set the maximum permissible level of benzene in drinking water at 5 parts per billion of water (5 ppb). It is also used as a hydraulic fracturing ingredient and is listed as a constituent of a compound that Chesapeake Appalachia documented it may use (FRW 25M, see Appendix A).

NORMS, naturally occurring radioactive materials, are also discussed in some detail in the Draft and the constituents of NORMs found in PA and WVA wastewater listed. Radium 226



was found in samples in PA and WVA and documented in the Draft, well beyond safe drinking water levels (DSGEIS, Table 5-10). Trihalomethanes, were also found in flowback fluid samples from WVA; some trihalomethanes are classified as carcinogenic (DSGEIS 5-110). These and other dangerous heavy metals, barium, acetone, 4-Nitroquinoline-1 –oxide, bromide, chloride, sodium, toluene, and high Total Dissolved Solids were all listed as found in substantial quantities in multiple samples from PA, WVA, and NY in the Draft (DSGEIS Table 5-9).

However, the Draft does not address how this flowback and wastewater will be disposed in a state where there are no available facilities to accept the flows that will be produced by shale gas development; and there is no cumulative analysis of the quantities and chemical constituents that will have to be treated. Disposal at out of state industrial treatment facilities, public sewage treatment plants, or injection into underground wells are presented as options (DSGEIS page 5-121), and re-cycling or reuse is discussed to some extent (DSGEIS, section 5.12.2.1).

But the fact that there are no industrial treatment facilities available within New York State, the fact that the few injection wells that do exist in New York do not likely have available room, the lack of NY sewage plants that are amenable and/or have filed applications to accept gas drilling wastewater, and the utter lack of any regulation to address many wastewater constituents that the Draft identifies, is oddly ignored (although it is stated that SPDES regulatory change will be needed to address TDS, though specifics or strategy for this is not detailed). The only currently available option is to ship wastewater off to Pennsylvania and the Draft includes a Table that lists available PA facilities (DSGEIS Table 5-14). It is unclear if these facilities have the capacity or the necessary permits to accept New York's gas drilling wastewater.

DEC must plan for disposing of its own gas drilling wastewater, not skirt the issue by sending it off to Pennsylvania. Pennsylvania is already producing more wastewater than it can safely process, as evidenced by the recent repeat of a Drinking Water Advisory on the Monongahela River that flows through Pittsburgh and provides drinking water to 325,000 people and many industries. Due to extremely high Total Dissolved Solids (TDS) and salts from gas drilling wastewater overloads, people have been advised to drink bottled water three times within a one year period, even though PADEP tried to limit what sewage treatment plants could take in.

Also, the death of Dunkard Creek (that meanders back and forth across the Pennsylvania and West Virginia border) in September of this year is sad testimony to the effects of poorly tracked and overdone injection of gas drilling wastewater into a coal mine that sent TDS and salts into the Creek, and, combined with other toxic effects, killed 10,000 fish representing 161 species of aquatic life.

Many of PA's streams and rivers are already overloaded with TDS (as documented in PADEP's Public Notice for rulemaking) which has led PADEP to propose changes to their Chapter 95 regulations to set an effluent standard for TDS (500 ppm), chloride (250 ppm), and sulfates (250 ppm) that would take effect in 2011. DRN is critical of the regulations and feels the changes do not go far enough to address the constituents of gas drilling wastewater, do not address cumulative effects on waterway quality or background levels in receiving streams, allow unwarranted grandfathering and a disastrous interim policy that will degrade PA's remaining high quality streams, and that 500 ppm TDS is not protective of fish and aquatic life. In DRN's opinion, even after regulations are adopted if they are promulgated as proposed, gas

drilling wastewater discharges in PA will continue to degrade waterways and harm water supplies.

63% of Pennsylvania is underlain by Marcellus shale and the industry is exploiting it full throttle. Pennsylvania has the largest land mass in the Delaware River Watershed and contributes huge flows to the Delaware River. The Delaware River will be directly harmed by New York's wastewater passed through Pennsylvania's inadequate systems.

But PADEP has been forced to take this action due no action being taken thus far despite the terrible polluting legacy of coal mining, coal bed methane and oil drilling in the State and even though they are issuing Marcellus shale drilling permits at breakneck speed; more gas drilling permits have been issued this year than ever in history in Pennsylvania, yet their funding has just been cut by almost 30% in the state budget. The result of this "wild west" scene in PA is disastrous for water quality and aquatic ecosystems. It is wrong for New York to contribute to this PA problem.

**Some water pollution pathways** available to the chemicals used in hydraulic fracturing and produced as flowback are presented by the Draft but then dismissed as manageable through best management practices at the individual well site and proposed conditions that require setbacks and other measures (DGEIS, Chapter 6 and 7). The Draft does not mandate through regulation the use of precautions that would prevent pollution.

For instance, the handling of imported chemicals, shown schematically in the Draft, is not recognized realistically as a source of accidental pollution from spills, leaks, equipment failure and human error that will inevitably occur considering the scale of activity described in the Draft at the intensely used 10-well pad sites. In light of the numerous incidents of these accidental events in PA where shale gas is undergoing rapid development, DEC is acting with blinders on by dismissing the dangers as manageable and of no substantial consequence. The Dunkard Creek, PA disaster mentioned above, albeit caused by a combination of shale gas wastewater, coal bed methane wastewater and mining discharges, resulted when gas drilling entered the picture and is one of the worst ecological disasters in modern Pennsylvania history.

Recent spills in Dimock Township, Susquehanna County, PA (in September 2009 3 spills of fracturing fluids occurred, 2 entered Stevens Creek, causing a fish kill; diesel spills related to gas drilling by Cabot dumped 100 gal., 800 gal. and 1000 gal. of fuel on the ground in 3 separate incidents in 2009) and in McKean County (PADEP found Schreiner Co. committing pit and other gas well violations, endangering the community and environment), among others in Bradford County, Hickory, and Washington, PA illustrate the frequency and severity of accidents when dangerous chemicals and wastewater is handled so close to waterways, sensitive ecosystems and residential areas.

Similarly, the possibility of contamination through the action of well drilling, casing failure, and fracturing techniques is not fully assessed in the Draft. The migration of methane into shallow groundwater aquifers has occurred as recently as this year in Dimock Township where Cabot Gas Co. was fined \$150,000 by PADEP for polluting 13 water wells and several square miles of aquifer with methane, an explosive gas (<http://www.ahs2.dep.state.pa.us/newsreleases>). And due to this and other environmental problems residents in the Dimock area have filed a class action law suit because they are not satisfied with the reparations offered through the PADEP process.

Also, PADEP found Schreiner Oil and Gas responsible for contaminating at least 7 water supplies with methane and/or high levels of iron and manganese, ruining local wells in McKean County, PA

(<http://www.ahs2.dep.state.pa.us/newsreleases/default.asp?ID=5494&varQueryType=Detail>).

Additionally, the existence of natural fractures that can connect the target formation to shallow groundwater, that connect deep saline water deposits with potable water, the possibility of the generation of new fractures or extended fractures through the action of hydraulic fracturing and drilling and the possible destabilization of existing formations and their fractures through natural and induced seismic events all are not recognized as substantial issues that need full analysis and prevention planning. The Draft states that seismic activity may occur in some regions of the Marcellus shale fairway in New York (and natural gas hydraulic fracturing is being blamed for induced earthquakes in Texas' Barnett Shale), yet these events are not discussed or analyzed with a goal of preventing harm.

Throughout the discussion of possible pollution pathways, the Draft dismisses the possibility of these all-too-common incidents as manageable through existing oversights. This is a wrong assumption, as current events in PA's shale gas region proves. The worst case scenario must be analyzed and means to avoid these pollution incidents must be put in place by DEC.

**Further compounding the threat of pollution is the storage** of flowback and fracturing fluids in open pits on the well site. The Draft suggests permit conditions to not allow open pits within specific distances of waterways (500 feet) and in floodplains (DSGEIS 7-72 and Appendix 10) but these are not regulations that would require closed tanks across the board and does not apply to uplands or areas next to restricted setback distances. In fact, the Draft suggests large open pits may be built to collect fluids from many well sites over long periods of time, ranging from 1 acre to 5 acres in size holding between 1 to 16 million gallons serving wells within a 4 mile area (DSGEIS section 5.12.2.1).

The impacts of installing large ponds are not discussed at all and the compounding of pollution opportunity from overflows, compromised embankments, torn pit liners and stormwater and overland flow inputs, as well as intrusion into high water tables and dam failures that would cause flooding and overland pollution are not recognized or assessed in the Draft. The number of pits that would be needed is not analyzed cumulatively either; considering the immense scale of shale gas development expected, the construction of these collective pits and of individual well site pits needs to be assessed cumulatively in terms of pollution pathways and also environmental impacts to other waterways, natural and manmade ponds such as agricultural ponds and recreational lakes.

Storage of condensate in tanks on completed production well sites also have impacts, both to air (hydrocarbons, VOCs, as discussed below) and to water should leaks or spills occur from the tank or during routine transfer and transport from tank to other locations. The Draft does state that shale gas from certain areas is expected to be "wet", which will require bleeding off of condensates on a permanent basis over the life of the well. Yet this is not analyzed in the Draft and no plans for avoiding or mitigating these air pollutants is considered.

**Air Quality Impacts:** The Draft discusses at some length the potential for air pollution from gas well development (DGEIS Section 6.5). However, it is startling that DEC recognizes that methanol, for instance - a known constituent in hydraulic fracturing mixtures and pit contents - will be released quickly by open pits to the air, violating air standards yet does not ban its use

or not allow its discharge to open pits but simply proposes to address this and other dangerous air emissions from pads and pits by fencing off an area. The area proposed is not, as would logically be expected, considered as a setback regulation but as a condition required on a case by case basis. The amount of additional land needed around each well pad and pit is not even reflected in existing spacing requirements for well sites.

Similarly, very specific conditions about stack height, the use of low sulfur fuels, and other assumptions are built into scenarios that show that receptors (human beings) are being kept away from the emissions. Yet the real-world application of these conditions is not analyzed based on known topography, geography, existing settlements, public spaces, towns, farms, etc. If slope, air currents, weather conditions, etc. change and dominate a site's emissions pattern, then all paper exercises about assumed conditions become irrelevant.

Perhaps the most disturbing is that the air pollution problems discussed in Chapter 6 are not solved in the end; the pollution is not prevented, it is simply demonstrated that it may be possible under certain conditions to keep receptors from direct exposure. And the impacts on nonhuman receptors is not even mentioned. This ignores ambient air pollution problems. Again, a cumulative analysis of the impacts of gas well development on air quality would be the way to understand the full potential of these air pollution problems and would allow DEC to set some limits and plan for preventing air degradation. But these emissions are accepted as part of gas development making the inevitability of individual and cumulative air degradation seem certain.

This is certainly borne out in other gas drilling regions such as the Barnett Shale in Dish, Texas where 61% of the health problems reported by residents in a survey are associated with the toxic air emissions, according to an independent analysis ([http://earthworksaction.org/pubs/DishTXHealthSurvey\\_FINAL\\_hi.pdf](http://earthworksaction.org/pubs/DishTXHealthSurvey_FINAL_hi.pdf)).

Also, in Wyoming the State Dept. of Environmental Quality commented to the Bureau of Land Management during the NEPA review for the Pinedale Anticline Project Area that significant mitigation measures, controls and monitoring were necessary to reduce NOx emissions, visibility impacts, and ozone elevation, including ambient air monitoring stations and regular inspections and reporting (Wyoming Dept. of Environmental Quality, letter to BLM from John Corra, Director, d. 4.2.07).

And a Houston study calculated the Volatile Organic Compounds (VOCs) in vapors released from permanent gas well storage tanks located at finished well sites. The storage tanks hold liquids that are bled off natural gas which contains moisture as it comes out of the ground; the moisture is made up of water and gas products, termed "condensates". These condensates easily evaporate and escape through pressure valves on the tanks. The study shows that natural gas extraction in Texas is contributing polluting emissions that are poorly tracked and regulated. Compressors used to pump gas through pipelines were also tracked and found to be a significant contributor to pollution that contributes to the classification of regions in Texas and Wyoming as severe non-attainment areas for ozone (<http://www.harc.edu/Search/Results.aspx?q=Storage+Tank+VOCs>).

It must also be remembered that air pollutants deposit on surface water bodies, providing another pathway for this pollution.

DEC's apparent acceptance of air pollution, despite the minimal and tenuous mitigation efforts suggested as permit conditions, is unacceptable. An SGEIS must be prepared that fully assesses, individually and cumulatively air impacts and then works through regulation to prevent air quality degradation.

**Floodplain and Stream Impacts:** DEC must ban all components of a gas well project from its Special Flood Hazard Area in order to protect from increased and damaging flooding in the State's streams and rivers, particularly considering the recent flood history in the Delaware River watershed (3 catastrophic floods in 2004-2006). Flooding is a major issue in the Delaware River Watershed. New York confirms that flooding may be worsened by natural gas development due to: 1. Hydraulic fracturing fluid chemicals that may enter a waterway from fracturing procedures, open pits, spills or accidents (GEIS, 8-44); 2. Out of date flood maps (DSGEIS, 2-34-35); 3. Land use changes (land clearing, larger well pads, etc.) that increase stormwater runoff volume from natural gas well sites (DSGEIS, 6-15-16); 4. Other pollutants and debris at well sites (GEIS, 8-44).

However, DEC still allows gas wells and infrastructure to be placed in New York's Special Flood Hazard Area, which is the 100 year floodplain and they only add the requirement for a floodplain development permit from the appropriate agency and that closed tanks be used for flowback fluids (DSGEIS, 7-72 and Appendix 10). DEC must not allow any part of any drilling project in the regulated floodplain and must provide a setback from all streams and waterways that is not based on a simple footage measurement .

The Draft offers (not as regulation but as a possible permit condition) stream setbacks that are not large enough, do not prohibit floodplain construction, and don't place a needed "no disturbance" buffer on streams, only a minimal setback distance for some drilling components. The proposed 150 foot setback from the well pad and 500 foot setback from an open pit to a stream is not protective of water quality, stream structure, aquatic life and the hydrology of the stream. DEC is actually proposing that gas wells be drilled in the floodplain because the floodplain can extend far beyond 150 feet from a stream, even further than 500 feet.

In New Jersey for instance, based on extensive scientific analysis, a 300 foot minimum buffer is required for all high quality streams for all activities and prohibited within the buffer is vegetation disturbance (except for invasive removal and stream restoration), any fill whatsoever, or any soil disturbance in order to preserve the high water quality and aquatic ecosystem of their best streams (New Jersey Surface Water Quality Standards, NJAC 7:9B).

Many of New York's streams, including in the Catskills and Upper Delaware River, are high quality streams yet no extra protection is afforded and for streams that are not classified as high quality, there is no protection for their presently designated uses, despite the proposed measures discussed in the Draft. And DEC's claims that existing stormwater rules will protect from erosion and runoff is incorrect—water quality is minimally addressed and water volume not addressed at all in New York's stormwater regulations.

DEC doesn't even take responsibility in the Draft for regulating incursions into the Special Flood Hazard Area, which is allowed with a floodplain development permit. This is passed off to "local and state permitting processes" which leaves the floodplain open to uncoordinated, piecemeal management—one of the existing failed regulatory approaches that has led to increases in volume of runoff due to changed land use that contributes to the catastrophic flooding we all experience in the Delaware River Watershed and other New York watersheds.

Without comprehensive regulation by DEC that places all floodplains and an additional buffer area off limits to any component of a gas development site, natural gas activities will be adding to the persistent, increasing, and presently poorly controlled floods that plague us, resulting in horrific flood damages. Add projected climate change impacts that are increasing storm flows and sea level rise, the problem becomes degenerative. It is an aspect of public safety and preventive regulation that the State can so easily justify; it is hard to understand why DEC would avoid it. It is simply irresponsible on the part of DEC. The lack of any attempt by DEC to conduct a cumulative impact analysis further exacerbates this problem.

Further, the lack of adequate stream flow protections in New York's streams through existing regulation (and the lack of any proposed regulations in the Draft) means that water resource depletion and stream flow disruption will occur. The lack of state regulation of industrial or commercial water withdrawals makes over-withdrawals and lack of healthy stream flow regimes a problem in New York wherever an area is not covered by other agencies such as the Delaware River Basin Commission (DRBC) or Susquehanna River Basin Commission (SRBC). And inadequate wetlands, groundwater and aquifer, and threatened and endangered species rules make it worse for New York's streams.

DEC proposes through the Draft to employ the Natural Flow Regime Method as an "interim measure" until the State promulgates regulations to implement a recently enacted water quality standard for the 'designated best use' of a stream. DEC needs to WAIT until those rules are in place before allowing any withdrawals. In fact the Clean Water Act mandates that the State protect the best designated uses of its waterways anyway, so allowing withdrawals to move ahead before those rules are implemented would seem to be in violation of EPA anti-degradation requirements—New York should already doing that. A policy quickly developed for gas drilling development on an "interim" basis is not good enough.

But also the devil is in the details on the application of protective flow regimes. The proposed Natural Flow Regime Method is a step in the right direction, but how pass-by flows will be calculated based on this method is unclear. We advocate for an ecologically-based stream flow regime. It is not clear if the method being considered will accomplish that.

This is not a simple technical issue but requires extensive scientific analysis and vetting. Even agencies striving for more protective minimum flow requirements are not "getting it right" when it comes to how those policies are being applied. For instance, the DRBC approach to setting a protective pass-by flow still exposed the West Branch of the Delaware River to over withdrawal by Chesapeake Gas who wanted to use the Q710, a historic low, as a pass-by flow in their permit application for a withdrawal of 1 million gallons of water per day. That application was revised by DRBC with a higher pass-by flow and then Chesapeake withdrew it.

The DRBC is re-examining its approach in its gas-specific regulations it is developing and its Subcommittee on Ecological Flows has been working on a protective flow regime method for years. DEC cannot expect to slap together a pass-by method that requires extensive stream habitat data and flow data that may not exist. Reference streams, mentioned in the Draft, are not necessarily accurate. If there is no flow gauge and no habitat data on a waterway, then no withdrawal should be permitted and this should be stated in the Draft.

New York's streams and rivers need flows protected based on an ecological flow regime that considers habitat that is verifiable and best use, applied across the board to all waterways.



Otherwise, New York's streams will look like the degraded streams of Pennsylvania, West Virginia, and worse. A SGEIS must be prepared that fully evaluates how to protect the State's streams and floodplains, avoid flood damages and increased flooding, and enhance and restore the water quality and living resources of the State's streams and rivers by effective and strict regulation of all gas related projects.

**Special regions and water supply watersheds (including NYC reservoir watershed and Upper Delaware River watershed) must be made off limits to gas projects utilizing**

**damaging methods**: DRN supplied a list of 22 special resource and ecologically vulnerable areas that should be off limits to gas projects -- including water wellheads and aquifer recharge areas, critical habitats, high quality forests, public parks, densely urban areas and more -- but the Draft placed nothing off limits to the gas industry except what other laws already designate. That list is attached as Appendix B and is resubmitted with this comment as areas that should be considered as off-limit areas to all shale gas activities.

Site specific reviews are required for specified setback areas around public and private water wells and waterways and some management requirements have been proposed such as closed loop systems instead of open pits in floodplains (DSGEIS, 7.1) but these are inadequate. Certain vulnerable and irreplaceable assets need special protection by being placed off limits completely.

At least 15 million people rely on the Delaware River for water supply. The exceptional quality of the Upper Delaware's headwaters makes that possible. That is why DRN states earlier in this comment and underscores here that the Upper Delaware River Watershed should be placed off-limits to gas drilling that utilizes hydraulic fracturing and horizontal drilling techniques and that requires large scale land use change that will impair the positive ecological and water resource benefits of the intact naturally vegetated and high quality ecosystems of the upper reaches of the Delaware River Watershed (including its tributaries and their drainage areas), the areas where Marcellus shale is located. We also oppose shale gas development projects in areas where restoration of impaired resources is needed in order to restore the benefits of a healthy environment, such as some Schuylkill River headwaters, a major tributary to the Delaware River.

The up to 9 million people who rely on NYC's Delaware Basin reservoir watershed enjoy the largest unfiltered water supply in the nation. The water quality is so high that the City has been granted a waiver by the US Environmental Protection Agency from building a \$10 billion water filtration plant. That special approval is based on the City's comprehensive Watershed Protection Plan, put in place over the last 2 decades for millions of dollars. DRN participated in that watershed protection process over the last two decades and considers the benefits of watershed protection that is practiced in the drainage area of the West-of-Hudson reservoirs, located on the Delaware River's headwaters, to be vital in maintaining the high exceptional water quality of the streams that flow from the reservoirs.

As has been made very clear by NYCDEP in its comments, Rapid Assessment and Final Report, NYC's reservoir watershed must be made off-limits to shale gas development in order to protect the City's water supply, comply with their Watershed Rules, and honor EPA's Filtration Avoidance Determination ([NYCDEP's comments on the dSGEIS \(PDF\)](#) and [Final Impact Assessment Report \(PDF\)](#)). DRN fully supports a ban on all shale gas projects in NYC's reservoir drainage area, including discharge of gas drilling wastewater and the withdrawal of water from the reservoir system and its drainage area.

**The Upper Delaware Scenic and Recreational River and Catskill Park:** DEC mentions that the potential impacts on the Upper Delaware Scenic and Recreational River and Catskill Park as part of the reason they conducted the SGEIS (DSGEIS 1-4). Yet this is glossed over and never confronted as the crucial issue that it is. Congress designated the Upper and Middle Delaware River as part of the Wild and Scenic River system in 1978. Most of the non-tidal river is now a Wild and Scenic River and special regulations to give that designation teeth have been adopted by the Delaware River basin Commission.

First, the Middle Delaware River will be directly impacted by drilling since the Marcellus shale and other tight shale formations extend into the Middle Delaware River. Second, all of the nationally designated river, including the Lower Delaware Wild and Scenic River, will be impacted by shale gas development through water resource impacts that are inescapable to downstream residents and water users, including the consumption of billions of gallons of fresh high quality water from the river and its tributaries and the discharge of gas drilling wastewater into tributaries and the main stem of the Delaware River, anywhere in the approximate 13,000 square mile Watershed. Third, the outstanding resources that merited the inclusion of the Delaware River into the National Wild and Scenic System are at risk, including the scenic, recreational, habitat and community character aspects of the River.

Lastly, Catskill Park is a forested, farmed and creek-filled gem that protects the mountains that feed the streams and rivers of the Delaware and Hudson. All the same impacts that threaten the Wild and Scenic River, threaten the state-owned and supported Catskill Park. The cursory attention paid by DEC to the impacts that shale gas development will have and the weak mitigation measures suggested do not address the sweeping changes that gas development brings. The lack of cumulative impact analysis makes the protection of these resources and natural features all the more difficult. DEC must revisit this aspect of the SGEIS in order to protect these resources, which are vulnerable to the type and scale of industrial development that is contemplated, endangering the very living and aesthetic resources that merited the River's designation.

**Monitoring and Documentation of Resources and Environmental Conditions is**

**Necessary:** The Draft does not attempt to provide basic data that can be used to measure detrimental impacts, as DRN and others requested in Scope comments—including the development of baseline water quality data (both ground and surface water), air quality data, habitat, species, human health and land condition data and does not propose the monitoring of impacts on water, air, habitats, species, communities, human health, and other resources during well development. Current biological and ecosystem data, stream flow and groundwater recharge data is also needed and is not recognized as necessary in the Draft. The lack of data means less than adequate protections for existing resources and features and the great potential for loss of those resources due to lack of information. The Draft must be pulled back to include requirements for resource inventorying for current conditions and a system put in place to gather baseline data and to monitor changes over time into perpetuity.

**Environmental Justice:** The Draft does not address environmental justice issues that are clearly raised by the patterns of natural gas development that is currently underway in areas in where extraction and production is already happening. Many areas where gas leases are already signed in New York are rural with median household incomes that are less than the overall average. Gas

companies are taking advantage of communities that are in need, offering the hope of economic prosperity.

Chesapeake Gas Co. has estimated that a well drawing from 160 acres in the Marcellus Shale could produce 2 billion cubic feet of natural gas; at current prices that's \$2.5 to \$4 million dollars in royalties to the landowner (Harold Brubaker, "Betting on a Bonanza", Philadelphia Inquirer, 7.6.08). This is being viewed as a boon to historically economically depressed communities that typify the Upper Delaware River Watershed (For example, median household income in Delaware County, NY, is \$34,000, as per Binghamton Press and Sun-Bulletin, "More residents get gas lease offers", 5.24.08). Some towns, counties and even the state and federal government are leasing gas drilling rights of their public holdings. Municipalities such as Ebensburg, PA (Altoona Mirror, 8.6.08) and Mount Pleasant, PA (Daily Courier, 8.6.08) have signed leases for gas wells on town land. PA's Department of Conservation and Natural Resources is auctioning off leasing rights to state park land; 600,000 acres are already under lease to gas drillers.

An example of how the natural gas industry is taking advantage of vulnerable communities is well illustrated in the case of DELCORA Wastewater Treatment Plant. In this case, there will be no royalties or influx of cash to Chester, PA residents (along the Delaware River in southeastern PA), there will only be a price paid by the residents and environment of an already overburdened city without their consent. DELCORA received a permit from PADEP to add gas drilling wastewater to the waste they process and to increase their hydraulic load from 44 mgd to 50 mgd.

This was done without consultation with the residents of Chester who maintain an active and involved environmental justice organization (Dr. Horace Strand, Chester Environmental Partnership) and a government-appointed environmental justice monitor, and despite monthly meetings with PADEP staff who kept this information under wraps for several months after approval. Only when the DRBC publicly noticed the application they received from DELCORA for this same expansion (as required by DRBC regulations) did DRN, the Chester Environmental Partnership or the Public Interest Law Center of Philadelphia (PILCOP), who have represented the community in environmental justice law suits, discover that PADEP had already signed off on the request.

The environmental justice violations that are demonstrated by this example are based on the practice of dumping more pollution on areas already inundated and where minority or disadvantaged residents are located and not be in a position to protest or oppose polluting projects. Chester, PA, 15 miles south of Philadelphia, has 36,800 residents in a 4.8 square mile area but has no grocery store and few medical facilities. The city's population is 81% minority, has the highest unemployment rate in Delaware County, a mortality rate and a lung cancer mortality rate about 60% higher than Delaware County's and the highest infant mortality rate in PA ([http://www.med.upenn.edu/ceet/community\\_outreach/research\\_projects.shtml](http://www.med.upenn.edu/ceet/community_outreach/research_projects.shtml)). 90% of all toxic chemical and criteria air pollutants released in the County are from Chester, all solid waste for the entire county and medical waste from several facilities is incinerated or treated there and 90% of its raw sewage and sludge is as well. (<http://depts.washington.edu/envir202/Lessons/Lesson18.pdf> )

Sandwiched in between an industrial waste treatment facility, a major incinerator, industries, sludge pits, and major highways, the City became the poster child for environmental injustice and the community banded together many years ago and brought the first environmental justice case before the Supreme Court, represented by PILCOP. Since then, conditions have improved and the regular communication and involvement of Chester citizens in environmental issues has been well established for more than 12 years. But even this resolute and

committed community was overrun by the gas industry that approached DELCORA with lucrative offers and somehow managed, with PADEP's complicity, to slip this gas drilling wastewater permit past all watchdogs.

Luckily, the community in Chester, DRN, and other groups quickly got involved when this was discovered and PADEP promptly rescinded the permit last month but the DRBC will be considering its approval, perhaps as early as March 2010 (Delaware County Regional Water Quality Control Authority DELCORA, D-1992-18 CP-2, drbc.net). This story illustrates the power of the industry when they practice or participate in environmental injustice. DEC must study and assess patterns and propensity for this kind of unfair and illegal practice and plan for how to avoid its use in New York communities, especially considering the poor economic times that the state and nation are experiencing.

**Scale of Development:** The Draft does not recognize or address the outsized scale of natural gas development in New York State. Spacing requirements are discussed in statutory terms but in fact, there is no effort to recognize the transformative power of this new industry on the communities, both human and nonhuman, of the Marcellus and other shale fairways. By not limiting gas development through the recognition of vulnerable and irreplaceable resources, by not acknowledging the true dangers of practices used for shale gas extraction (and for non-shale gas and oil development, see Toxics Targeting Inc. report on 270 oil and gas pollution incidents in NY, many of them never cleaned up, 11.8.09), by not preparing a cumulative analysis of adverse impacts, by not developing regulations, by not attempting to prevent environmental degradation and harm, the Draft fails in its charge to assess the environmental impacts of shale gas development.

The changes that will be brought to New York will be nothing less than the industrialization of what is now a largely natural landscape, exceptional quality waters, aesthetic and scenic beauty, small communities, and rural lifestyle – the biggest change since the deforestation and death of the Catskills in the 1800's. DRN implores DEC not to repeat that tragedy. These changes, in all their complexity, warrant and require a comprehensive analysis and thorough and strict regulations to prevent adverse impacts. **DRN requests that DEC withdraw the Draft SGEIS and perform a new comprehensive analysis based on the comments provided herein. DRN also advocates for the ban on all shale gas permits and gas related projects to remain in place until the SGEIS is complete and regulations are implemented.**

Thank you for the opportunity to comment on the Draft SGEIS.

Sincerely,

Maya K. van Rossum  
the Delaware Riverkeeper

Tracy Carluccio  
Deputy Director, Delaware Riverkeeper Network

Attachments: Appendix A (part 1 and 2) and Appendix B.

## APPENDIX B

Examples of no-drill areas are (including but not limited to):  
the New York City Watershed drainage area;  
other major public water supply drainage areas;  
National Wild and Scenic Rivers;  
National Recreation Areas;  
water wells and their wellhead protection areas as defined by the contributing aquifer based on wellhead and fracture trace analyses;  
major earthquake faults;  
carbonate rock formations;  
floodplains and riparian areas as defined by riparian soils;  
steep slopes (15% and greater);  
critical habitat for threatened, endangered and rare species (flora and fauna); wetlands and wetland buffers;  
vernal pools and their buffers;  
high quality forest areas as defined by dense patch areas, deep woods, mature trees and/or contiguous forest regions;  
prime groundwater recharge areas;  
unique rock formations;  
significant natural areas including vegetative communities;  
non-attainment zones for air pollutants;  
air pollution hotspots;  
federally or regionally recognized scenic and historic resources;  
agricultural preservation lands;  
public parks;  
preserved land, private or public;  
areas where density of existing natural gas wells already meets the spacing threshold for horizontal well bores;  
urban areas where population density exceeds the definition of high density as per Clean Water Act NPDES regulations.

Examples of areas or conditions that should be prohibited from water withdrawals are:  
headwaters;  
first order streams;  
streams with no historic stream flow gauges above and below the withdrawal point;  
streams that flow to the New York City reservoirs in the Delaware/Catskill water supply system or to other public water supply reservoirs;  
streams that are already allocated at or beyond the safe yield of the stream based on the low flow margin of safety defined as the margin between two stream low flow statistics -- September median flow and the seven day-ten year low flow (7Q10) (New Jersey Highlands Regional Water Supply Master Plan, Supporting Information, 2008) labeled as "deficit streams";  
streams that drain to deficit streams;  
streams that cannot support the ecological needs of the stream – including living ecosystem, fish, wildlife, macroinvertebrates, etc.-- if the withdrawal is made.

Examples of where groundwater withdrawals for natural gas development should not be allowed:  
aquifers that are located in watersheds that drain to deficit streams;

wellhead protection areas defined as contributing aquifers based on wellhead and fracture trace analyses;  
prime groundwater recharge areas defined as the area in a HUC 14 that is the best recharge area for that subwatershed, contributing 40% of the total recharge volume of the subwatershed (New Jersey Highlands Regional Water Supply Master Plan, Supporting Information, 2008);  
floodplains and riparian areas as defined by soils;  
wetlands and wetland buffers;  
vernal pools and vernal pool buffers;  
within the contributory plume of a documented groundwater pollution point.

Features that DEC needs to evaluate in the Draft Scope and then develop safe separation distances from natural gas wells for include:  
septic systems including all infrastructure such as tanks, lines and drainage fields;  
residences;  
open waters;  
water wells that are hydraulic fractured for greater volume;  
water and wastewater lines and aqueducts;  
public infrastructure such as roads, bridges, and parking areas, public buildings, hospitals and other health facilities, including critical transportation facilities as defined by US Department of Transportation;  
features that are vulnerable to specific impacts such as noise, odors, light and natural or induced seismic events and vibrations.

These lists are not exhaustive. DEC needs to develop a complete list in a new SGEIS.



**APPENDIX A** is attached to hard copy and scanned as part 1 and part 2 PDF's and attached to electronic submittal.

Note: Only page one of each MSDS sheet obtained is attached; full documents are available from NY DEC and DRBC.