CWCWC

Comments submitted December 31st, 2009

On the DRAFT Supplemental Generic Environmental Impact Statement On the Oil, Gas and Solution Mining Regulatory Program

New York State Department of Environmental Conservation
Division of Mineral Resources
September 2009

Introduction

The Croton Watershed Clean Water Coalition, Inc (CWCWC) is a not-for-profit alliance consisting of over fifty community, environmental, housing and religious groups. These groups extend throughout New York City, Westchester and Putnam Counties.

In addition to protecting the Croton Watershed, our mission statement includes a broader purpose, expressed as follows: " We are an alliance of individuals and groups who believe that safe, clean and affordable drinking water is a basic human right." This encompasses all watersheds throughout New York State, with emphasis on the West of Hudson watershed that supplies most of the water for Croton Watershed residents.

We shall start our comments with a June, 2009 study by the United States Department of Agriculture Forest Service that clearly shows that the whole Marcellus Shale in NYS underlies an unsurpassed source of drinking water, both in terms of quality and the number of people that it supplies - over 11 million. The quality of the water is in large part due to the abundance and health of those forested areas. In our opinion, any threat to the integrity of such an invaluable resource is unacceptable. Yet, horizontal drilling and high-volume hydraulic fracturing (fracking), if permitted, would threaten their viability and their ability to protect those water supplies.

In addition, during the course of 2009, CWCWC has commented, on various occasions, on the dSGEIS and the effects of drilling in the Marcellus Shale. Rather than repeat those comments in detail, we shall merely give an outline of each presentation with the complete document attached. A number of our comments have also been made by other groups. We shall only repeat those that have not been made by others, or that have not been sufficiently emphasized.

CWCWC Comments on
Forests, Water and People:
Drinking water supply and forest lands in the Northeast and Midwest United States

Martina C. Barnes, Albert H. Todd, Rebecca Whitney Lilja, and Paul K. Barten
United States Department of Agriculture
Forest Service
Northeastern Area State and Private Forestry

ABSTRACT: Forests are critically important to the supply of clean drinking water in the Northeast and Midwest portion of the United States. In this part of the country more than 52 million people depend on surface water supplies that are protected in large part by forested lands. The public is generally unaware of the threats to their water supplies or the connection between clean water and the extent and condition of forest lands in source water watersheds. The future security of water supplies will not be ensured by a focus on

water treatment alone. Protecting and managing forests in source watersheds is an essential part of future strategies for providing clean, safe drinking water that citizens can afford. This analysis uses a GIS-based process and a series of maps to create a watershed condition index based on physical and biological attributes. Using a multi-step process, this index is then used to compare 540 watersheds across 20 states and the District of Columbia, in terms of their ability to produce clean water. The study also quantifies the magnitude and scope of forest-dependent drinking water supplies, and their dependence on private forests; and it identifies watersheds that are threatened by land use change or are in need of management to sustain and improve forests that protect water supplies. The final maps and data display development pressure on private forests in watersheds important for drinking water.

In addition, trees and forests are essential in reducing air pollution, in acting as carbon sinks, in mitigating climate change, and in producing oxygen. Some estimates claim that one large tree, each year, helps clean the air by absorbing 10 lbs of air pollutants, 4 lbs of ozone and 330 lbs of carbon dioxide, and emitting 260 lbs of oxygen. Trees in NYS are estimated to store approximately 24.3 metric tons/hectare-year of carbon and an additional 0.8 metric tons/hectare-year from the atmosphere.

Trees and forests also play a fundamental role in maintaining stream quality. For example, streambank erosion is 30 times more prevalent on banks lacking vegetation. Deforestation leads to large deposits of calcium, aluminum and nitrates into streams - with as much as a 56-fold increase in nitrates from decaying organic matter. Streams that are deprived of an adequate canopy are subject to enhanced algae growth.

The area of interest is the Northeast.
Map 1: Study area. Shows that the Marcellus Shale area in NY - south of Buffalo - is mostly forested.
Map 2: Private and protected forest land: shows that area to be mostly in private hands.
Map 6: Index of the Ability to Produce Clean Water, watershed view: shows that most of the Marcellus Shale area, particularly the eastern half produces high quality water.

Table 6: lists the fourteen top-scoring watersheds for drinking water supply in the Northeast and Midwest. Seven of the fourteen are in NYS. They are:
East Branch Delaware
Middle Delaware
Schoharie
Middle Hudson
Lower Hudson
Hackensack-Passaic
Upper Delaware

Clearly, the quality of water overlaying the Marcellus Shale area ranges from good to very high. The study demonstrates that this high quality correlates with the forested areas. Unfortunately, fracking procedures would destroy the forests through outright clearcutting and/or fragmentation.

A choice has to be made between more natural gas from this area or preserving clean, healthy water.

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CWCWC Comments on the 2009 Draft NYS Energy Plan 8/21/09 Public Hearing, Hunter College, NY[i]

Buried among a series of good proposals such as promotion of energy conservation and renewables, a paragraph in the Draft NYS Energy Plan calls for "fracking" in the Marcellus Shale.

At the hearing, CWCWC pointed out the dangers of drilling to polluting NYC water as exemplified by Croton water that has necessitated the construction of a $3.2 billion filtration plant to remediate the pollution in those waters due to thoughtless development. With ten times more water to be processed from the Catskill/Delaware watershed, the costs would be astronomical.

CWCWC discussed the fragmentation of the forests where the drilling would occur, and the consequent diminution of those forests' ability to provide clean, fresh water.

Another point raised was Governor Paterson's Executive Order #25whose intent is to streamline the State Environmental Quality Review Act (SEQRA) in order to facilitate the permitting process for a grossly depleted DEC staff. The superficial project reviews that would ensue could only result in decisions leading to consequences destructive of water and air quality.

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CWCWC Comments at the NYC Council on Environmental Protection 10/23/09[ii]

Re: Res 1850-2009

CWCWC pointed out the unconscionably short time period allowed for the public to review the 800+page highly technical DSGEIS document. In addition, CWCWC claimed that DEC contravened SEQR regulations by not providing copies from the start of the review period, in the local libraries. That point is now moot. DEC finally relented and allowed an extra month.

The situation where the absolute safety of the unfiltered drinking water for

9 million people is at stake clearly calls for the exercise of the Precautionary Principle. In other words, there should be an absolute ban on fracking in the NYC watershed, as called for by the above Resolution 1850.

CWCWC took issue with the fact that the drilling companies are not obliged to reveal the chemicals that they use in fracking. Although lists of some chemicals have been revealed, others have not been revealed and kept as trade secrets. This includes combinations of chemicals that together can be harmful whereas separately, they are not. A database developed by the Endocrine Disruption Exchange identifies 435 products composed of over 340 individual chemical components used in fracking.

Normally Occurring Radioactive Material (NORM) in the flow-back water (estimated from 40% to 70%) is discussed - some cases being above acceptable levels. Another concern in flow-back water is the level of bromides whose disinfection byproducts could cause NYC water to be out of compliance with the Stage 2 Disinfection Byproduct Rule.

A major concern that appears unresolved is the safe disposal of these flowback materials. Most Water Treatment Plants, whether privately or publicly-owned, are not engineered to treat fracking chemicals, particularly if they are trade secrets! Burying these chemicals also presents problems that, so far, have not been satisfactorily resolved.

The Cat/Del watershed is heavily forested and relatively undeveloped. Fracking involves laying bare anywhere from 40 to 640 acres (1 square mile) of mostly forested land in order to provide area for the machinery. If drilling were to become more prevalent, the landscape would change from forested to pockmarked with bare, open spots. In addition, roads will have to be cut through the forests in order to haul the heavy equipment to the pads. The effects will be devastating to wildlife and any endangered and threatened species in the vicinity, whose habitat will be destroyed. Furthermore, fragmenting and destroying the forest will have a deleterious effect on water quality since forests are supreme in their ability to provide the best quality water.

The DSGEIS says nothing about negative impacts to wildlife and biodiversity, that are bound to happen due to the fragmentation and destruction of the forests, the abundance of trucks and heavy machinery - not to mention polluted air, noise and open pools of dangerously contaminated water. The DSGEIS does mention the possible introduction of invasive species, although it seems unlikely that even invasives would survive under those conditions.

The DSGEIS takes no account of the impacts on endangered species such as the Indiana Bat *(Myotis sodalis)*. Nor is there an analysis of possible historic sites that could be affected by drilling activities. All such analyses should be included.

Testing for the location of shale deposits is accomplished through the use of "Thumper Trucks". By detonating explosives below ground, they generate large amounts of energy in the form of waves. The various paths taken by the waves give an indication

of below-ground conditions. There is concern that these explosions that generate waves with an energy of up to 100,000 pound-foot could promote earthquakes which would further weaken the fissures promoted by fracking, and release the deep-lying toxic water through the intervening layers and into the groundwater.

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CWCWC Comments at the 11/10/09 Hearing in NYC
On the
Draft Supplemental Generic Environmental Impact Statement
On the Oil, Gas, and Solution Mining Regulatory Program
New York State Department of Environmental Conservation, Division of Mineral Resources[iii]

And High-Volume Hydraulic Fracturing to

Develop the Marcellus Shale and Other

Low-Permeability Gas Reservoirs, September 2009

New York State Department of Environmental Conservation, Division of Mineral Resources

DEC has not offered any new rules specifically tailored to fracking even though its potential environmental impacts are many times greater than those from standard drilling techniques.

New regulations should be promulgated, tested and approved prior to any fracking applications even being considered. In addition, an independent review team of experts should examine effects on air, water, wildlife and scenic viewsheds plus effects on neighboring lands and economies. On-the-ground field review must be done prior to leasing of lands for fracking and definitely prior to permits being issued.

Fracking requires the use of hundreds of chemicals, organic and inorganic, many of them known to be harmful to health and a threat to life. Many of the compounds remain trade secrets. These chemicals are added to the millions of gallons of water that are sent into the wells to fracture the shale and release the natural gas. Lists of these chemicals have been supplied to DEC by Halliburton and Schlumberger, among others.

In order to protect NYS's environment and natural resources and before any permit is given, DEC and the public must have full knowledge of all chemicals and their compounds, including trade secrets.

There is also the danger of contamination by these chemicals of neighboring wells, aquifers, lakes, stream and reservoirs because of the unpredictable way in which fissures may open up from the fracking, and underground blast tests. Therefore, all wells within a range of 2 miles from the edge of the spacing unit should be tested for chemical content prior to any blasting or fracking. If a well becomes contaminated, the burden of proof must rest with the drilling company.

Shifting the burden of proof to the drilling company rather than to the owner whose well has become polluted is now underway. Quoting from WATER POLICY REPORT, September 28, 2009, we read as follows:

"The U.S. Court of Appeals for the 10th Circuit - which includes key drilling states of Oklahoma, Wyoming, Kansas, Colorado, Utah and New Mexico - in April ruled in *State of New Mexico, ex rel. v. Bureau of Land Management* that the bureau must conduct further analysis under NEPA of the drilling activities covered by its resource management plan for the Otera Mesa region, including providing more evidence that drilling would not harm the aquifer.

Meanwhile, a federal district court in Colorado Sept. 3 granted environmentalists' request for a preliminary injunction to block exploratory oil and gas drilling in the Baca National Wildlife Refuge until the resolution of the case, *San Luis Valley Ecosystem Council et al. v. U.S. Fish and Wildlife Services [FWS]*...both rulings are significant because they show the courts appear to be shifting from requiring activists to prove likely harm under NEPA to requiring agencies to prove that harm will be prevented..."

It is stated that the access roads will be narrow, yet the pictures show considerably more damage since wide swaths on either side of the road are laid bare. We can foresee a landscape where once healthy and vast extents of forests are fragmented and pockmarked with drilling units - a sure way to destroy forest health and viability. Forests are our best producers and protectors of clean water and clean air. Destroying them also destroys unequalled sources of clean, healthy water and leads to air pollution.

DEC concedes that air pollution from fracking is a serious problem and that exceedances of national air quality standards will occur at so-called receptor points in areas near the operations. DEC's solution is straightforward. Don't make the company decrease its air pollutants. Simply tell the public to stay away.

The dSGEIS, in its present form, is nowhere near adequate to protect either the public or the environment from the destructive impacts of fracking.

With no real safeguards, there should be no fracking allowed in NYS.

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Senate Standing Committee on Environmental Conservation
Senator Antoine M. Thompson, Chair

Roundtable Discussion
11/10/2009[iv]

In many cases where owners' wells get polluted, with clear indications that the pollution coincided with drilling activities, an owner may have great difficulty in proving that the pollution originated with drilling. The burden of proof gets shifted to the owner rather than having the drilling company prove that they are not responsible for the pollution.

The attachment gives numerous examples, by no means a complete list, of owner's wells being polluted or even blowing up due to an accumulation of methane.

As already mentioned, CWCWC urges that all wells within a 2-mile range from any spacing unit be carefully tested for chemicals. If any new fracking chemicals are subsequently discovered in those wells, then the burden of proof must lie with the drilling company to prove that they are not responsible.

These are cases where the Precautionary Principle should be applied. Given the drastic cutback in manpower at DEC resulting in DEC's inability to properly monitor drilling operations, the emphasis must be on "preventive action in the face of uncertainty" (see Wikipedia), i.e., no drilling should be permitted until adequate monitoring is possible, at the very least.

Large areas of the Marcellus Shale are heavily forested and relatively undeveloped. Fracking involves laying bare anywhere from 40 to 640 acres (1 square mile) of mostly forested land in order to provide the area for the machinery. To access the spacing units, roads must be cut through the forests in order to haul the heavy equipment to the drilling pads. The dSGEIS claims that these roads will be narrow, yet the pictures show otherwise, with wide swaths on either side of the access roads devoid of trees.

If fracking becomes prevalent, the cumulative effects will be devastating to wildlife and any endangered and/or threatened species whose habitats will be destroyed. Yet, the dSGEIS does not address this issue - a serious omission that must be addressed.

Also, the landscape will change from heavily forested to an unrecognizable patchwork of forest fragments dotted with clearings filled with trucks, pipes and an assortment of drilling equipment. Fragmenting invites invasive species; long-term, it destroys the viability of the forest.

The loss of forest has serious consequences in terms of air and water quality. Since forests are well known to be the best providers of clean water and clean air, the cumulative effects of forest destruction lead to a less healthy environment for that area's population. These consequences must be addressed in the dSGEIS.

The dSGEIS concedes that air pollution from fracking is a serious problem. Even one unit can exceed national air quality standards at so-called receptor points. The cumulative and long-term effects of many units are not even mentioned. Rather than try and diminish air pollution to comply with national air quality standards, the dSGEIS simply recommends that fencing be installed to keep the public at some safe distance away from the polluted areas.

The long-term effects of air pollution on the health of the on-site workers are not even discussed. It should be thoroughly examined in the DSGEIS.

The preceding discussion should make clear that fracking can have a major negative environmental that requires a specific regulatory framework. The patchwork of permitting procedures that now apply are obviously insufficient. They can be too easily circumvented by the applicant, with the public unable to examine the many hundreds of applications that will be submitted.

Since fracking is occurring in many parts of the U.S., and since it involves procedures that have demonstrated the potential for inflicting major environmental harm, well beyond any impacts that now occur through vertical drilling, we recommend that fracking in NYS be administered through state rulemaking under the state Administrative Procedure Act.

We urge that the NYS legislature enact a law that embodies the goals it needs to achieve, including the protection of public health and safety, and the protection of the environment from the impacts of fracking. Either a new entity or an existing administrative agency should be assigned to craft more detailed regulations, based on the best available research. The regulatory language should be approved by the public and all involved parties, and subsequently codified under NYS law.

Since fracking is still rare in NYS, regulated parties should come into compliance soon after publication of the rule.

Fracking presents threats to human health and safety, and to the environment, that go far beyond conventional drilling. Before it is too late, the present patchwork of permitting rules must be superseded by regulations, based on sound law and sound science, that are truly protective of public health and the natural environment.

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[i] SEP Comments
NYSERDA
17 Columbia Circle
Albany, NY 12203-6399

CWCWC Comments at the August 21st Public Hearing on the 2009 Draft NYS Energy Plan

The Croton Watershed Clean Water Coalition, Inc. is a not-for-profit coalition of over 50 groups - community, environmental, housing and religious - whose objective is to maintain safe, clean and affordable drinking water for NYC and NYS residents, with particular emphasis on the Croton water supply.

The Draft NYS Energy Plan would "encourage development of the Marcellus Shale natural gas formation with environmental safeguards that are protective of water supplies and natural resources."

NYC's Delaware watershed that supplies superb quality, still unfiltered drinking water for up to 60% of the NYC metropolitan area's needs, lies within the Marcellus Shale.

CWCWC considers the Energy Plan's program to extract natural gas within the NYC watershed to be a dire threat, indeed an unacceptable threat to the integrity of the drinking water supply for over 9 million NYS residents. Furthermore, we are adamantly opposed to hydrofracturing, or "fracking", which is the most likely method to be used for gas extraction.

NYC has an unparalleled source of drinking water that lies within a 2,000 square mile watershed. 90% of NYC and metropolitan needs are supplied by the West-of-Hudson (WOH) Catskill/Delaware (Cat/Del) watershed. The remaining 10% are supplied by the East-of-Hudson (EOH) Croton watershed.

The negative environmental impacts of development in the Croton Watershed have forced the construction of a chemical treatment/filtration plant costing over $3 billion.

The Cat/Del watershed remains far less developed, and is over 70% forested.

Thanks to the abundance of forest, the water from this watershed is of such high quality that it only requires minimal treatment - a probable saving of over $20 billion should a water treatment plant have to be built because of water contamination.

But water contamination is exactly what is likely to happen if "fracking" is allowed in the Delaware watershed. "Fracking" includes:

- Clearing access roads through the forest and clearing a well site that can be anywhere from 3 acres to 30 acres
- Extracting from 1 to 3 million gallons of water from the aquifer (this is likely to deplete nearby streams that will lose their base-flow during the dry months) or trucking in the needed water from elsewhere;
- Mixing the water with sand and chemicals whose mix is a trade secret;

- Drilling a well several thousand feet deep;
- Drilling at right angles through the shale layer for another several thousand feet;
- Forcing the water down into the well under such power that it will break up the shale containing gas and release the gas into the well;

At least 40% of the chemically contaminated water can remain below ground for up to four years, and seep into the aquifer before gradually being absorbed and diluted. The remaining contaminated water is either trucked off to be treated at a sewage treatment plant that is, one hopes, suitably equipped to treat the chemicals, or is stored in above-ground pools at the site. In the latter case, runoff from storm water and infiltration into groundwater pose a threat.

These well sites leave gaping holes in the forest canopy, and the truck roads fragment the forest itself. Both have the effect of weakening the forest and diminishing its unique ability to provide clean, fresh water.

The potential for contamination of local wells, aquifers, streams and reservoirs is very real. Already there have been numerous reports of local wells being contaminated although the gas drillers claim that this is but a small percentage. However, it is a 100% loss for the homeowner. And the loss to the 9 million NYS residents who depend on this water would be immeasurably higher.

Because "fracking" can cause irretrievable damage to NYC's main source of drinking water, the permitting agencies and authorities must bear the full burden of proof that this method of extraction will not degrade it in any way.

Only if the most stringent regulations are strictly enforced will there be any realistic hope of protecting our drinking water.

Unfortunately, there seems to be little desire for strict enforcement by the Governor and the NYS agencies. The Governor's recent Executive Order #25, under the pretexts of efficiency and saving money, in reality merely eases the permitting process for a sadly-depleted DEC staff, and shortens the applicant's period of waiting for a permit. It does nothing to protect our water.

With NYS facing difficult economic times, the Governor would, no doubt, be pleased for NYS to receive $1 billion in anticipated revenues from gas drilling. Difficult as it may be, however, we urge the Governor to take the long-term view and not sacrifice NYS's unique resource, its drinking water, for short-term gains.

We urge that gas drilling in the NYC watershed be excluded from 2009 NYS Energy Plan.

Thank you for this opportunity to comment.

Marian H. Rose, Ph.D.
Director
CWCWC

[ii] NYC Council Committee on Environmental Protection
October 23, 2009

COMMENTS RE HYDROFRACTURING IN THE NYC WATERSHED PORTION OF THE MARCELLUS SHALE
Croton Watershed Clean Water Coalition, Inc.
Federated Conservationists of Westchester County, Inc.

As not-for-profit organizations among whose concerns is the protection and preservation of NYC's high quality drinking water that serves 9 million people, we are deeply concerned that the proposal to extract natural gas in the underlying Marcellus Shale through hydrofracturing will lead to the contamination and pollution of NYC's unsurpassed source of water.

NYC is the largest city in the world that is blessed with high quality drinking water that still only requires minimal treatment prior to reaching its consumers. NYC's 75% forested, still largely undeveloped watershed is the provider of this high quality water. Because of the DEP's strenuous efforts to protect its watershed and maintain the high quality of water in its reservoirs, the EPA has granted a Filtration Avoidance Determination (FAD) for its Catskill/Delaware (Cat/Del) watershed that lies mainly West of Hudson (WOH) entirely in the Marcellus Shale area. NYC's Croton Watershed that lies East of Hudson (EOH) was not so fortunate. Due to development pressures in the Croton watershed, EPA was not willing to grant it a FAD. As a consequence, NYC is in the process of building a chemical filtration plant for the Croton. The plant was originally estimated at $800 million. That cost has now risen to $3.2 billion, accompanied by skyrocketing rises for NYC ratepayers. The Cat/Del can supply at least ten times as much water to NYC as the Croton. If Cat/Del water were contaminated because of drilling for natural gas in the Marcellus Shale, or some other cause, the accompanying costs for a filtration plant would be astronomical. Neither NYC nor NYS residents who receive NYC water should have to be burdened with such a cost.

DEC's presentation of the possibilities of drilling in the NYC Watershed comes at a time of severe economic stress, when Governor Paterson is trying, by any means possible, to close NYS's $3 billion budget gap. Estimates for the revenue from drilling for natural gas in the Marcellus Shale are in the $1 billion figure.

The Governor has been trying to streamline the approval process for developments in NYS by issuing Executive Order #25. As stated in our 8/14/09 letter to the Governor, " ... the Regulatory Review and Reform Program, purportedly for the purpose to ' evaluate, reform, or repeal, where necessary, rules and paperwork requirements...' would merely streamline the processes through which developers, oil and gas companies and others could obtain permits, and make it more difficult, if not impossible, for the average citizen to have a voice in preventing environmental degradation."

DEC has now published its 10/5/09 DSGEIS report - Well Permit Issuance for Horizontal Drilling And High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas reservoirs - (available at OGdSGEIS at the DEC website).

In keeping with the streamlining process, the Governor is pushing for early hearings and the rapid acceptance of the DSGEIS. The public has only till November 30th to respond with written comments, a ridiculously short time for having to comment on over 800 pages laden with a heavy technical content.

In addition, the document appears not to be available in some of the NYC public libraries, listed by DEC as repositories for the report. This contravenes 6 NYCRR Part 617.12(b)(3): "All SEQR documents and notices, including but not limited to, EAF, negative declarations, positive declarations, scopes, notices of completion of an EIS, EISs, notices of hearings and findings must be maintained in files that are readily accessible to the public and made available on request" and (5) "If sufficient copies of the EIS are not available to meet the public interest, the lead agency must provide an additional copy of the documents to the local library."

The fact that DEC started the review process prior to having the document available in the local libraries, appears to contravene the above SEQR law. The clock should start when all documentation needed for comments is available to the public. Because of the size of the document and the fact that it was not available to members of the public, the written comment period should be extended to January 31st, 2010.

Besides the DSGEIS, there is the Draft NYS Energy Plan that also calls for natural gas drilling in the Marcellus Shale. *CWCWC* and FCWC consider the Energy Plan's insistence on extraction of natural gas within the NYC watershed to be a dire threat, indeed an unacceptable threat, to the integrity of the drinking water supply for over 9 million NYS residents, and has expressed that view at the 8/21/09 Public Hearing held at Hunter College.

In the following comments, *CWCWC* and FCWC will present an overview of the many hazards to water quality that are inevitable consequences of fracking. Most of these hazards are described in detail in Hazen and Sawyer's 9/2009 Rapid Impact Assessment Report (RIAR), commissioned by DEP. DEP will have a complete report ready by mid-December.

We shall also challenge the contention in the 10/5/09 DSGEIS report that drilling in the NYC Watershed area of the Marcellus Shale can be done safely, if the proper precautions are taken.

In a situation where the unfiltered drinking water of 9 million people is at stake, absolute safety is required - a clearly impossible goal. Therefore, this is a classical example that calls for the exercise of the Precautionary Principle.

A Brief Introduction to "Fracking"

From the DEP Report, page ES-2: "The area of land assigned to a well is called a spacing unit, and the number of wells that may be drilled in an area is based on NYSDEC spacing unit regulations. A minimum spacing unit of 40 acres is required for a single well, and a 640 acre spacing unit is required for multiple wells drilled from a common wellpad. Once the site is prepared and the wellpad is completed, operators begin drilling the well. One or more wells may be drilled from a single wellpad. In the NYC watershed area, the well would likely consist of a 3,000 to 7,000 feet deep vertical section that extends out laterally for an additional 2,000 to 6,000 feet....Construction of gas wells in the Marcellus Shale will require drilling through shallow aquifers and penetrating formations that may contain high level of total dissolved solids, hydrocarbons, heavy metals, radionuclides or other potential contaminants. The wellbore creates a conduit for fluid flow between these previously isolated geologic formations." A mixture of water, sand, and chemicals is then injected into the well at high pressure to create fractures in the shale and release the gas. "An average fracturing operation may require on the order of from three to nine million gallons of water, 1% to 2% of which reportedly consists of various products and chemicals designed to control fluid properties and facilitate fracturing."

Although 1% to 2% of chemicals might appear to be too small to be harmful, we must remember that, in many cases, harmful concentrations are measured in parts per million.

Moreover, the names of the chemicals that are injected into the shale and that could contaminate their drinking water are shamefully kept secret from the public. From Earthworks: "Despite the widespread use of the practice, and the risks hydraulic fracturing poses to human health and safe drinking water supplies, the U.S. Environmental Protection Agency ("EPA") does not regulate the injection of fracturing fluids under the Safe Drinking Water Act. The oil and gas industry is the only industry in America that is allowed by EPA to inject known hazardous materials -- unchecked -- directly into or adjacent to underground drinking water supplies."

The three to nine million gallons of water have to be obtained from the most convenient source available. If there is no nearby source available, the millions of gallons have to be trucked in. Otherwise they are sucked out of the local sources. This presents a danger of

depleting aquifers, the base-flow for streams, drying up wetlands, and lowering the depth of local lakes, ponds, and reservoirs.

The risks of private wells being contaminated by the fracking process are very real, as we show in the next section. The reasons are not hard to find. Millions of gallons of fluid are injected into the shale under intensely high pressure that opens up the fissures in the shale and releases the gas. From the RIAR, page 18: "Upward vertical migration through extensive, open fractures or an improperly sealed gas well can allow for the cross-formational migration of groundwater between flow regimes (i.e., short-circuiting). Such a migration can allow for the discharge of high salinity and gas enriched groundwater directly to the ground surface or into shallower (local or intermediate) flow regimes. Under these conditions, the discharged groundwater could occur at a considerable distance from the corresponding source area and formation."

It is easily seen that, in many cases, the upward migration of fracking fluid mixed with highly saline fluids that are present at the depth of the shale can contaminate the well waters of local residents. A 40-acre wellpad, the minimum allowed per wellhead, would allow a neighboring wellhead as close as 750 feet. Assuming the neighboring well goes down to 500 feet, that the fracking well goes to a depth of 3,000 feet and then horizontally about 2,000 feet, the fracking material released from the horizontal portion could be as close as 1,500 feet - not a great distance for fluid under high pressure to travel.

Incidents of Private Wells Being Contaminated and Burden of Proof

Having read through the extensive documentation pertaining to hydrofracturing or "fracking" in the Marcellus Shale, we can only come to one conclusion - fracking should be banned in the NYC watershed. The risks of contaminating the watershed's groundwater, streams, wetlands and reservoirs are diverse and, in many cases, unforeseeable and therefore uncontrollable. It is inevitable that over time, contamination will occur.

In fact, there have been numerous incidents of contamination in other watersheds. For example the Texas Groundwater Protection Committee has reported an average of 6,000 alleges groundwater contamination cases per year, since 1990, with 5,267 cases being currently investigated for 2007. Apparently, these have not deterred natural gas drilling. However, the situation in NYS is radically different. It would take only a small fraction of those occurrences for EPA to withdraw its FAD for the Cat/Del, an action that would place a near intolerable burden on NYC finances and as well as on many of its residents.

ProPublica (August 4, 2009) reported that "The incident is the latest in a string of more than 50 similar cases related to gas drilling in the state...", the incident being a natural gas well leak near the town of Roaring Brook, PA. Further reports by ProPublica refer to four

homes in Lycoming County, PA that have lost their drinking water to pollution, due to gas drilling, and 18 other homes where the water is being tested.

Earthworks, in an August 14, 2009 Press Release, describes how citizens in Pavillion, WY call for a fracking moratorium. They found that "11 of 39 tested wells were contaminated. Among the contaminants are toxics used in oil and gas production."

In several cases, local residents whose wells have been adversely affected have considerable trouble being reimbursed for the damages they suffered. The drilling company will argue that the chemicals found in a well are the same as those used as lawn pesticides, for example. The burden of proof is thus cleverly shifted to the victim.

We recommend that all wells, within a reasonable range, be carefully tested for the quality and quantity of chemicals that they may happen to contain. If any new chemicals are discovered subsequently to the start of operations, then the burden of proof must be clearly on the drilling company to prove that they are not responsible.

Given the cutback in manpower at DEC for the sake of so-called "streamlining", we fear that adequate monitoring of wells is not possible and that local residents who have lost their potable water will be left with little recourse.

Fracking Chemicals

A database developed by the Endocrine Disruption Exchange (RIAR, p. 36) identifies 435 products composed of over 340 individual chemical components used in fracking. However, the drilling companies have been reluctant to divulge which chemicals they use in the fracking process, claiming the privilege of trade secrets. In particular, they do not reveal how these various chemicals are combined to make products that are used in fracking. We liken this to being told that carbon, nitrogen, oxygen, and hydrogen are harmless, and not being told that, if combined in the correct proportions and configuration, they can produce TNT. The drilling companies have not been forthcoming in informing the public as to what is being injected into their aquifers. Although *CWCWC* hopes that permits will never be issued in the NYC watershed, should such an unhappy event occur, however, no permits should be allowed until the drilling companies provide full, complete lists of all the components and combinations they use in their drilling activities.

To do otherwise would be a dereliction of NYS's duty to protect public health and safety.

Storage of Hazardous Waste

There are various estimates on how much of the injected, chemically-laden water, flows back to the surface. Estimates vary between 40% and 70%, possibly depending on

whether already existing water within the shale layer, is included. This flow-back water is laden with contaminants such as cobalt, chromium, salts and lead, among others. An additional concern is the surfacing of materials containing Naturally Occurring Radioactive Material or NORM. According to the River Reporter (see http://www.riverreporter.com/issues/09-01-08/news-backflow.html), "NORM consists of Radium 226 and Radium 228, which are bone seekers that result in lung cancer and bone cancer." This wastewater has an unusually high brine water content, as well as Total Dissolved Solids (TDS), radionuclides and chemicals, all of which must be disposed of safely. Bromides are a concern since their disinfection byproducts are as dangerous, or even more so, than the haloacetic acids and trihalomethanes normally found to some extent in NYC water. Disinfection byproducts due to bromides could cause NYC water to be out of compliance with Stage 2 Disinfection Byproduct Rule.

It is shocking to see pictures of the hazardous waste water that is retrieved from the drilling process "stored" in open pits, merely lined with plastic. There appear to be no precautions against the effects of a heavy storm that could easily wash the hazardous mix into neighboring streams, lakes, and wetlands with disastrous effects on local fish and wildlife.

The usual procedure, if on-site storage is only temporary, is to transport the hazardous waste to a sewage treatment plant (STP) that is supposedly capable of cleaning it. This can present a multitude of problems.

First, only a few STPs are capable of dealing with an unusual mix of chemicals, some of which are not required to be revealed under the Trade Secret Law. Since tens of millions of gallons of water are used in fracking, and these have to be treated by the STPs, the result is that an individual STP likely will not be able to deal thoroughly with the volume, resulting in improperly treated effluent - not only the fracking water but also the sewage waste that the STP is originally designed for.

In NYS there are no specialized STPs for this kind of waste. Therefore, an alternative might be to store the waste via deep underground injection wells. However, disposal sites are limited due to the volume and the hazardous nature of the material According to the RIAR, "Overall, waste management failures were responsible for the majority of documented water contamination incidents related to natural gas development." In addition, costs could be exorbitant. Even if suitable waste disposal sites were found, their use would still be problematical since the Underground Injection Control (UIC) program does not regulate materials that are not being injected under the waste disposal programs. In other words, there would be little supervision or control.

Thus, the problems associated with storing hazardous waste could, of themselves, be sufficient to ban gas drilling in the NYC Watershed.

The transport of these hazardous wastes is also a problem. Most will be transported in NYS approved trucks, some having a capacity of up to 9,000 gallons. A fracking

operation can use up to 3 million gallons (mg) of water. Unless these 3mg are sucked out of the ground locally, they will have to be transported to the site by truck. That would require 600 trips of the largest trucks to bring the fracking water to the site, and a near equivalent number to haul the wastewater away, depending on how much is retrieved.

Accidents are unavoidable, and some trucks filled with hazardous waste will inevitably spill their contents into the NYC watershed.

Additional Concerns

We have touched on what we deem to be the main threats to the integrity of NYC water in the Cat/Del watershed. In our opinion those threats are so dangerous that they warrant the prohibition of drilling in the NYC watershed.

There are other threats, each has a lesser impact, yet taken together could do irreparable damage to the watershed.

Destruction of Land and Forests

The Cat/Del watershed is heavily forested and relatively undeveloped. Fracking involves laying bare anywhere from 40 to 640 acres (1 square mile) of mostly forested land in order to provide the area for the machinery. If drilling were to become more prevalent, the landscape would change from forest to one pockmarked with bare spots. In addition, roads will have to be cut through the forests in order to haul the heavy equipment to the pads. The effects will be devastating to wildlife and any endangered and threatened species in the vicinity, whose habitat will be destroyed. Furthermore, fragmenting and destroying the forest will have a deleterious effect on water quality since forests are supreme in their ability to provide the best quality water.

Laying of Pipes

Gas transmission pipelines may lie above ground or up to 6 feet below ground. Constructing the pipeline creates disturbance and can severely impact sensitive wildlife habitat as well as neighboring streams, wetlands and reservoirs, if improperly installed. Herbicides and other 'cides should be used sparingly. According to the RIAR, page 44, "Gas treatment at compressor stations and/or refineries may require chemicals and create liquid wastes that if handled improperly could lead to surface water or groundwater contamination."

Seismic Testing

Testing for the location of shale deposits is accomplished through the use of "Thumper Trucks". By detonating explosives below ground, they generate energy in the form of waves. The various paths taken by the waves give an indication of below-ground conditions. There is concern that these explosions that generate waves with an energy of up to 100,000 pound-foot could promote earthquakes which would further weaken the fissures promoted by fracking, and release the deep-lying toxic water, through the intervening layers and into the groundwater.

In conclusion, we would like to reiterate that the Catskill/Delaware Watershed is a unique area in the world that supplies high quality water, with a minimum of treatment, to over 9 million people. Unlike areas that are less sensitive because they do not have comparable water resources, although they may have other resources such as oil and gas, the Cat/Del cannot tolerate any impacts that would pose a threat to its hard-won Filtration Avoidance Determination The result would be an unacceptable financial burden on NYC residents and all those who use Cat/Del water, to pay $20 to $30 billion for a filtration plant, not counting inevitable inflation.

The NYC watersheds not only supply superb water. They also supply some of the most beautiful landscape in the world - that graces the Hudson River and its valley with its mountains, rivers and forests. There is nothing like it.

If contamination should occur, no one really knows for how long it may last and whether it could ever be remediated, let alone what illness could result to humans, wildlife and vegetation. The potential astronomical cost aside, how could we ever replace this excellent, world-renowned water? If we cannot use the reservoir system, what do we do for water?

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CWCWC Comments at the

11/10/2009 Hearing in NYC

on the

Draft Supplemental Generic Environment Impact Statement

On the Oil, Gas and Solution Mining Regulatory Program

Well Permit Issuance for Horizontal Drilling

And High-Volume Hydraulic Fracturing to

Develop the Marcellus Shale and Other

Low-Permeability Gas Reservoirs, September 2009

New York State Department of Environmental Conservation, Division of

Mineral Resources

DEC's mandate, as displayed on their website, is: "Conserving, improving and protecting New York State's natural resources and environment".

The 803 pages of the dSGEIS on permitting fracking in NYS is nothing but a departmental guide for obtaining a permit to use high-volume, hydraulic fracturing in New York State.

It serves as a permitting tool for the driller to exploit a NYS resource while, at the same time, doing irreparable harm to NYS's natural environment.

It tells the driller that if some, not-too-onerous criteria are met, a permit will be issued.

Why should we not be surprised? In retrospect, the Governor's Executive Order #25 that facilitates the permitting process and the cutting of staff, together with the recently issued NYS Draft Energy Plan that would quote "encourage development of the Marcellus Shale natural gas formation with environmental safeguards that are protective of water supplies and natural resources" - here leave no doubt that the Marcellus Shale is for sale.

The "environmental safeguards" are thrown in for good measure but, if you manage to dispense with the verbiage in the 803-page dSGEIS, you will note that these safeguards do not really protect the environment or the public against the massive impacts of fracking.

In fact, the DEC has not offered any new rules specifically tailored to fracking even though its potential environmental impacts are many times greater than those from standard drilling techniques.

New regulations should be promulgated, tested and approved prior to any fracking applications even being considered. In addition, an independent review team of experts should examine effects on air, water, wildlife and scenic viewsheds plus effects on neighboring lands and economies. On-the-ground field review must be done prior to leasing of lands for fracking and definitely prior to permits being issued.

Fracking requires the use of hundreds of chemicals, organic and inorganic, many of them known to be harmful to health and a threat to life. Many of the compounds remain trade secrets. These chemicals are added to the millions of gallons of water that are sent into the wells to fracture the shale and release the natural gas. Lists of these chemicals have been supplied to DEC by Halliburton and Schlumberger, among others.

In order to protect NYS's environment and natural resources and before any permit is given, DEC and the public must have full knowledge of all chemicals and their compounds, including trade secrets.

There is also the danger of contamination by these chemicals of neighboring wells, aquifers, lakes, stream and reservoirs because of the unpredictable way in which fissures may open up from the fracking, and underground blast tests. Therefore, all wells within a range of 2 miles from the edge of the spacing unit should be tested for chemical content prior to any blasting or fracking. If a well becomes contaminated, the burden of proof must rest with the fracking company.

Despite DEC's clear mandate to protect the state's natural resources, there is no mention of impacts on endangered or threatened species through the cutting of roads through forests, the incessant noise, the clearings for spacing units that can measure up to one square mile, the storage of dangerous chemicals in above-ground open pools, the possible depletion of groundwater and stream levels through drawdown of millions of gallons of water needed for fracking.

It is stated that the access roads will be narrow, yet the pictures show considerably more damage since wide swaths on either side of the road are laid bare. We can foresee a landscape where once healthy and vast extents of forests are fragmented and pockmarked with drilling units - a sure way to destroy forest health and viability. Forests are our best producers and protectors of clean water and clean air. Destroying them also destroys unequalled sources of clean, healthy water and leads to air pollution.

DEC concedes that air pollution from fracking is a serious problem and that exceedances of national air quality standards will occur at so-called receptor points in areas near the operations. DEC's solution is straightforward. Don't make the company decrease its air pollutants. Simply tell the public to stay away.

The dSGEIS, in its present form, is nowhere near adequate to protect either the public or the environment from the destructive impacts of fracking.

With no real safeguards, there should be no fracking allowed in NYS.

[iv] Senate Standing Committee on Environmental Conservation

Senator Antoine M. Thompson, Chair

Roundtable Discussion
11/10/2009

CWCWC is a not-for-profit organization among whose concerns is the protection and preservation of NYS's high quality drinking water. We are troubled that the proposal to extract natural gas in the underlying Marcellus Shale through high-volume hydraulic fracturing with horizontal drilling or "fracking" (see attachment: A Brief Introduction to Fracking), will lead to the contamination and pollution of NYC's unsurpassed, still unfiltered source of water that supplies 9 million NYS residents. We are equally concerned that fracking of source water in NYS's other watersheds that overlay the Marcellus Shale could be similarly polluted.

DEC's 803-page, September 2009, draft Supplemental Generic Environmental Impact Statement (dSGEIS) on the Oil, Gas and Solution Mining Regulatory Program (Well Permit Issuances for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas Reservoirs, dSGEIS) does little to alleviate those fears of contamination. In addition, even though air quality standards admittedly will be exceeded at individual fracking units, yet the cumulative effects of many units are not even mentioned. Nor is there mention of the impacts on threatened or endangered species, on forests due to fragmentation, of stormwater runoff, on the health of onsite workers, and of noise pollution.

Because of the many threats to our environment that are evident in the dSGEIS, several members of *CWCWC* have undertaken to analyze the document. Unfortunately, in addition to being unnecessarily long due to some of the issues being presented in a repetitive fashion, the end result is that the dSGEIS offers little protection, and our water, air and environmental surroundings will remain frighteningly vulnerable to the impacts of fracking.

In the following, we shall explain some of those concerns. Rather than repeat issues that have already been belabored, we include those that we think have not been sufficiently addressed in the dSGEIS. These are:

- The Precautionary Principle and the Burden of Proof
- SEQRA and the approval process should be strengthened, not streamlined
- Storage and treatment of hazardous wastes
- Long-term and cumulative impacts
- Rulemaking

THE PRECAUTIONARY PRINCIPLE AND THE BURDEN OF PROOF

From Wikipedia: "The precautionary principle is a moral and political principle which states that if an action or policy might cause severe or irreversible harm to the public or to the environment, in the absence of a scientific consensus that harm would not ensue, the burden of proof falls on those who would advocate taking the action. The principle implies that there is a responsibility to intervene and protect the public from exposure to harm where scientific investigation discovers a plausible risk in the course of having screened for other suspected causes."

The Precautionary Principle also emphasizes the importance and necessity for public participation in the decision-making process, i.e. the importance of a democratic process, and the need for an in-depth review of alternatives. Most important is the emphasis on preventive action in the face of uncertainty.

In several cases, local residents whose wells have been adversely affected have considerable trouble being reimbursed for the damages they have suffered. Drilling companies have argued, for example, that the chemicals found in a well are the same as those used as lawn pesticides. The burden of proof is thus cleverly shifted to the victims

who seldom, if ever, have the engineering, legal or financial resources to match the drilling company's.

We urge that all local wells, within a 2-mile range from any spacing unit, be carefully tested for all chemicals whether separate or in compounds, prior to the start of fracking operations. If any new fracking chemicals are subsequently discovered in those wells, then the burden of proof must lie with the drilling company to prove that they are not responsible.

Given the cutback in manpower at DEC for the sake of so-called "streamlining", adequate monitoring of wells is problematical and local residents who have lost their potable water will be left with little recourse.

Examples (see attachment: Examples of Contamination Due to Fracking) from various parts of the country, showing contamination by fracking, provide compelling evidence why the Precautionary Principle should be fully implemented before any more permits are issued.

SEQRA AND THE APPROVAL PROCESS SHOULD BE STRENGTHENED, NOT STREAMLINED

DEC's dSGEIS comes at a time of severe economic stress for NYS, when Governor Paterson is trying, by any means possible, to close the state's $3 billion budget gap. Estimates for the revenue from fracking for gas in the Marcellus Shale are in the $1 billion figure.

Governor Paterson is trying to streamline the approval process for developments in NYS.

One approach was by the Governor issuing Executive Order #25. As stated in our 8/14/09 letter to the Governor, " ... the Regulatory Review and Reform Program,

purportedly for the purpose to ' evaluate, reform, or repeal, where necessary, rules and paperwork requirements...' would merely streamline the processes through which developers, oil and gas companies and others could obtain permits, and make it more difficult, if not impossible, for the average citizen to have a voice in preventing environmental degradation."

In keeping with the streamlining process, the Governor has been pushing for early hearings and the rapid acceptance of the dSGEIS. Until 11/4/09, the public had only until November 30th to respond with written comments, a ridiculously short time for having to read, understand, and comment on over 800 pages laden with a heavy technical content. Furthermore, the document appears to not have been available for several weeks in some of the NYC public libraries, listed by DEC as repositories for the report. This contravenes 6 NYCRR Part 617.12(b)(3): "All SEQR documents and notices, including but not limited to, EAF, negative declarations, positive declarations, scopes, notices of completion of an EIS, EISs, notices of hearings and findings must be maintained in files that are readily accessible to the public and made available on request" and (5) "If sufficient copies of the EIS are not available to meet the public interest, the lead agency must provide an additional copy of the documents to the local library."

The fact that DEC started the review process prior to the document being available in the local libraries, appears to contravene SEQR law. The clock should start when all documentation needed for comments is readily available to members of the public. Given this late availability, and the intervening holiday season, the written comment period should be extended to January 31st, 2010.

However, as the result of insistent urging, that deadline has at least been extended to 12/31/09.

Prior to the appearance of the dSGEIS, the Draft NYS Energy Plan already called for gas drilling in the Marcellus Shale, one of its recommendations being to "Encourage

development of the Marcellus Shale natural gas formation with environmental safeguards that are protective of water supplies and natural resources."

At the 8/21/09 Public Hearing held at Hunter College, *CWCWC* expressed the view that fracking within the NYC watershed is a dire threat, indeed an unacceptable threat, to the integrity of the drinking water supply for over 9 million NYS residents. Indeed, *CWCWC* considers the threat to the integrity of any watershed in NYS to be unacceptable.

Another approach being promoted by the Governor is to streamline SEQRA that has not been revised since 1996.

CWCWC agrees that SEQRA needs revision but in a direction in keeping with the Precautionary Principle that emphasizes "the importance and necessity for public participation in the decision-making process". For now, the public's input to SEQRA is marginal. The public may submit written comments at the DEIS level to which the applicant has to respond. If the applicant's responses in the FEIS simply skirt some issues or are inaccurate, the public has no further opportunity to comment unless someone petitions the lead agency to keep the comment period open. SEQRA should be amended to allow the public the opportunity to respond, as of right.

Also, the SEQRA process is often accelerated by the Lead Agency rendering its Findings prior to all the Involved Agencies submitting their Findings. The lead Agency, in order to fulfill due diligence and its duty to the public, should have all the relevant information at its disposal prior to rendering its own Findings. This might lengthen the process but it would help avoid some uninformed decisions by the Lead Agency.

STORAGE AND TREATMENT OF HAZARDOUS WASTES

There are various estimates on how much of the injected, chemically-laden water, flows back to the surface. Estimates vary between 40% and 70%. This flow-back water is also

laden with existing contaminants in the shale such as cobalt, chromium, salts and lead, among others. An additional concern is the surfacing of materials containing Naturally Occurring Radioactive Material or NORM. According to the River Reporter (see http://www.riverreporter.com/issues/09-01-08/news-backflow.html), "NORM consists of Radium 226 and Radium 228, which are bone seekers that result in lung cancer and bone cancer." This wastewater has an unusually high brine water content, as well as Total Dissolved Solids (TDS), radionuclides and chemicals, all of which must be disposed of safely. Bromides are a concern since their disinfection byproducts are as dangerous, or even more so, than the haloacetic acids and trihalomethanes normally found to some extent in NYC water. Disinfection byproducts due to bromides could cause NYC water to be out of compliance with Stage 2 Disinfection Byproduct Rule.

It is shocking to see pictures of the hazardous waste water that is retrieved from the drilling process "stored" in open pits, lined only with a plastic sheet. There appear to be no viable storm water devices to mitigate the effects of a heavy storm that could easily wash the mostly poisonous mix into neighboring streams, lakes, and wetlands with disastrous effects on local fish and wildlife. The spacing units that can cover 640 acres, i.e. one square mile, are largely impervious and rendered even more so by the heavy traffic of hundreds of trucks carrying hazardous materials and fracking equipment of all kinds.

Installation of the feeder pipes carrying the gas to major pipelines is another source of pollution. Gas transmission pipelines may lie above ground or up to 6 feet below ground. Construction of a pipeline requires the use of herbicides and other 'cides that can severely impact sensitive wildlife habitat as well as neighboring streams, wetlands and reservoirs.

Thus, those 640 acres will become a source of uncontrolled and uncontrollable pollution to the surrounding land and water unless unremitting care is exercised.

A usual procedure, if on-site storage is only temporary, is to transport the hazardous waste to a sewage treatment plant (STP) that is supposedly capable of cleaning it. This can present a multitude of problems.

First, only a few STPs are capable of dealing with an unusual mix of chemicals besides regular waste, some of which are not required to be revealed under the Trade Secret Law. Since tens of millions of gallons of water are used in fracking, and these have to be treated by the STPs, the result is that an individual STP will likely not be able to process the volume. The result will be improperly treated effluent - not only the fracking water but also the sewage waste that the STP was originally designed for.

In NYS there are no specialized STPs for this kind of waste. An alternative might be to store the waste via deep underground injection wells. However, disposal sites are limited due to the volume and the hazardous nature of the material. According to the DEP's September, 2009 Rapid Impact Assessment Report (RIAR), "Overall, waste management failures were responsible for the majority of documented water contamination incidents related to natural gas development." In addition, costs could be exorbitant. Even if suitable waste disposal sites were found, their use would still be problematical since the Underground Injection Control (UIC) program does not regulate materials that are not being injected under the waste disposal programs. In other words, there would be little supervision or control.

Thus, the problems associated with storing hazardous waste could, of themselves, be sufficient to ban gas drilling in the NYS Watersheds.

The transport of these hazardous wastes is also a problem. Most will be transported in NYS approved trucks, some having a capacity of up to 9,000 gallons. A fracking operation can use up to 9 million gallons (mg) of water. Unless these 9mg are sucked out of the ground locally, they will have to be transported to the site by truck. That would require, at least, 600 trips of the largest trucks to bring the fracking water to the site, and

a near equivalent number to haul the wastewater away, depending on how much is retrieved.

Accidents are unavoidable. Some trucks filled with hazardous waste will inevitably spill their contents and spread contaminants to the surrounding land.

LONG -TERM AND CUMULATIVE IMPACTS

Large areas of the Marcellus Shale are heavily forested and relatively undeveloped. Fracking involves laying bare anywhere from 40 to 640 acres (1 square mile) of mostly forested land in order to provide the area for the machinery. To access the spacing units, roads must be cut through the forests in order to haul the heavy equipment to the drilling pads. The dSGEIS claims that these roads will be narrow, yet the pictures show otherwise, with wide swaths on either side of the access roads devoid of trees.

If fracking becomes prevalent, the cumulative effects will be devastating to wildlife and any endangered and/or threatened species whose habitats will be destroyed. Yet, the dSGEIS does not address this issue - a serious omission that must be addressed.

Also, the landscape will change from heavily forested to an unrecognizable patchwork of forest fragments dotted with clearings filled with trucks, pipes and an assortment of drilling equipment. Fragmenting invites invasive species; long-term, it destroys the viability of the forest.

The loss of forest has serious consequences in terms of air and water quality. Since forests are well known to be the best providers of clean water and clean air, the cumulative effects of forest destruction lead to a less healthy environment for that area's population. These consequences must be addressed in the dSGEIS.

The dSGEIS concedes that air pollution from fracking is a serious problem. Even one

unit can exceed national air quality standards at so-called receptor points. The cumulative and long-term effects of many units are not even mentioned. Rather than try and diminish air pollution to comply with national air quality standards, the dSGEIS simply recommends that fencing be installed to keep the public at some safe distance away from the polluted areas.

The long-term effects of air pollution on the health of the on-site workers are not even discussed.

Testing for the location of shale deposits is accomplished by detonating explosives below ground where they generate energy in the form of waves. The various paths taken by the waves give an indication of below-ground conditions. These explosions can generate waves with energies up to 100,000 pound-foot, sufficient to generate earthquakes that can further increase the fissures promoted by fracking. Long-term, there is the possibility of deep-lying toxic brine seeping through the intervening layers, and into the overlying groundwater.

RULEMAKING

The preceding discussion should make clear that fracking can have a major negative environmental that requires a specific regulatory framework. The patchwork of permitting procedures that now apply are obviously insufficient. They can be too easily circumvented by the applicant, with the public unable to examine the many hundreds of applications that will be submitted.

Since fracking is occurring in many parts of the U.S., and since it involves procedures that have demonstrated the potential for inflicting major environmental harm, well beyond any impacts that now occur through vertical drilling, we recommend that fracking in NYS be administered through state rulemaking under the state Administrative Procedure Act.

We urge that the NYS legislature enact a law that embodies the goals it needs to achieve, including the protection of public health and safety, and the protection of the environment from the impacts of fracking. Either a new entity or an existing administrative agency should be assigned to craft more detailed regulations, based on the best available research. The regulatory language should be approved by the public and all involved parties, and subsequently codified under NYS law.

Since fracking is still rare in NYS, regulated parties should come into compliance soon after publication of the rule.

Fracking presents threats to human health and safety, and to the environment, that go far beyond conventional drilling. Before it is too late, the present patchwork of permitting rules must be superseded by regulations, based on sound law and sound science, that are truly protective of public health and the natural environment.

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EXAMPLES OF CONTAMINATION DUE TO FRACKING

1. More Gas Contamination Affects Pennsylvania Residents

by Abrahm Lustgarten, ProPublica - August 4, 2009 1:45 pm EDT

A drilling crew move a section of steel pipe at a natural gas well site near Bradford, Pa., last August. (Robert Nickelsberg/Getty Images)

Pennsylvania environment officials are investigating another natural gas well leak, after residents near the town of Roaring Branch complained last month that rust-colored water was flowing from a spring and two small creeks were bubbling with methane gas.

The incident is the latest in a string of more than 50 similar cases related to gas drilling in the state, and comes as ProPublica published an article last week reporting that **such events were more frequent than officials said**.

2.EPA's study of gas drilling in Wyoming could impact local operations

By Tom Wilber
twilber@gannett.com

Debate over the environmental consequences of natural gas drilling in Broome County is reaching across the country.

The federal Environmental Protection Agency has found evidence of caustic chemicals associated with natural gas production in 11 private water supplies in the state of Wyoming. Those findings -- featured on Web sites and list-servers of advocacy groups urging more oversight of the drilling industry locally and nationally -- have intensified battle lines over controversial drilling regulations proposed by members of Congress representing communities in the Southern Tier and Colorado.

Meanwhile, local and national proponents of the drilling industry are rallying to defeat the proposal, called the FRAC Act, sponsored by Reps. Maurice Hinchey, D-Hurley, and Diana DeGette, a Democrat from Colorado.

3(a). Sudden death of ecosystem ravages long creek

'Everything is being killed': 161 aquatic species have died along Dunkard Creek

Sunday, September 20, 2009

By Don Hopey, Pittsburgh Post-Gazette

3(b). Bob Donaldson/Post-Gazette

Just 20 days ago, Dunkard Creek, which meanders lazily back and forth across the border of Pennsylvania and West Virginia, was one of the most ecologically diverse streams in both states, containing freshwater mussels, mudpuppy salamanders and a host of fish species from minnows to 3-foot-long muskies.

But today, the 38-mile creek is all but dead, its 161 species of fish, mussels, salamanders, crayfish and aquatic insects killed by mysterious pollutants coming from sources state and federal agencies have yet to pinpoint despite aggressive field work.

Environmental agencies are treating the creek as a crime scene. Longtime environmental and fisheries officials say the fish kill, which preliminary counts have put at more than 10,000, is one of the worst they've seen.

The Pennsylvania Department of Environmental Protection on Friday said more than 30 miles of the stream have been damaged by the discharge. It has killed 18 species of fish and at least 16 species of freshwater mussels, including the salamander mussel and the snuffbox mussel -- both candidates for federal listings as endangered species.

"This is the worst fish kill I've experienced in 21 years in West Virginia," said Paul Ziemkiewicz, director of the National Research Center for Coal and Energy's Water Research Institute at West Virginia University.

Environmental agencies in West Virginia and Pennsylvania, the Pennsylvania Fish and Boat Commission, the West Virginia Department of Natural Resources and the EPA each have had inspectors on the creek in recent weeks, testing water samples, collecting dead fish and observing discharges into the water.

... chemical analysis shows the creek water at the treatment facility site contains extremely high total dissolved solids, or TDS, and chlorides -- properties found in wastewater from Marcellus Shale gas well drilling operations but not mine water. Total dissolved solids may include metals, salts and other elements.

Marcellus Shale well drilling water contains about 100 chemicals added to reduce friction, eliminate algae growth and perform other functions when water is pumped underground under pressure to fracture the shale and release natural gas.

Up to 4 million gallons are used for each Marcellus Shale well. Disposal of wastewater from the wells has caused problems throughout Pennsylvania, including TDS readings that exceeded federal safe drinking water standards in the Monongahela River last winter and this year.

3(c)With Natural Gas Drilling Boom, Pennsylvania Faces an Onslaught of Wastewater

by Joaquin Sapien, ProPublica - October 3, 2009 11:05 pm EDT

The McKeesport Sewage Treatment Plant, one of nine plants on the Monongahela River that has treated wastewater from Marcellus Shale drilling operations. (Joaquin Sapien/ProPublica)

Workers at a steel mill and a power plant were the first to notice something strange about the Monongahela River last summer. The water that U.S. Steel and Allegheny Energy used to power their plants contained so much salty sediment that it was corroding their machinery [1]. Nearby residents saw something odd, too. Dishwashers were malfunctioning, and plates were coming out with spots that couldn't easily be rinsed off

Pennsylvania's Department of Environmental Protection soon identified the likely cause [2] and came up with a quick fix. The Monongahela, a drinking water source for 350,000 people, had apparently been contaminated by chemically tainted wastewater from the state's growing natural gas industry. So the DEP reduced the amount of drilling wastewater that was being discharged into the river and unlocked dams upstream to dilute the contamination.

But questions raised by the incident on the Monongahela haven't gone away.

In August, contamination levels in the river spiked [3] again, and the DEP still doesn't know exactly why. And this month the DEP began investigating whether drilling wastewater contributed to the death of 10,000 fish on a 33-mile stretch of Dunkard Creek, which winds through West Virginia and feeds into the Monongahela. A spate of other water contamination problems [4] have also been linked to gas drilling in Pennsylvania.

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4. Colorado county copes with methane mystery

By JUDITH KOHLER, Associated Press Writer – Sun Nov 1, 2009
WALSENBURG, Colo. –

Bernice and Jerry Angely like to show visitors the singed T-shirt a friend was wearing when their water well exploded and shot flames 30 feet high.

The friend wasn't hurt. But that and an explosion at another home weeks earlier forced Colorado to suspend natural gas drilling around this southern plains town until someone could find out why dangerous levels of methane were getting into the groundwater.

Two years later, Walsenburg and surrounding Huerfano County are still waiting, its residents caught in a collision between two of the West's vital resources: Water and natural gas.

"The water is so saturated with methane and other chemicals it is not to be used for human consumption," said Bernice Angely, who's had water trucked to her home 10 miles west of town since her well blew up in July 2007.

Petroglyph Energy Inc., a Boise, Idaho-based firm that has worked the rolling plains of the Raton Basin since 1999, suspended drilling until it can stem the methane. Colorado also is rewriting rules that had allowed Petroglyph to discharge water runoff from its drilling into streams and creeks.

But Petroglyph says it's not clear the drilling caused the methane leaks or prompted other area water wells to run dry. Eying what it calls an extremely promising natural gas field, it believes a shallow water formation tapped by area homeowners isn't connected to a deeper one pumped by the company for its drilling operations.

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5. August 14, 2009
EPA Confirms Drinking Water Contamination by Toxics Used in Hydraulic Fracturing

Joint Press Release: EARTHWORKS * Powder River Basin Resource Council
http://earthworksaction.org/PR_EPApavillionDrinkingWater.cfm

ProPublica: "EPA will investigate nearby oil and gas development to determine contamination source."

Pavillion, WY, August 14, 2009 - This week U.S. Environmental Protection Agency told a group of over 70 that initial investigations found 11 of 39 tested drinking water wells were contaminated. Among the contaminants are toxics used in oil and gas production.

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6. DEP Issues Citation to Pennsylvania Driller as a Third Spill Occurs

by Abrahm Lustgarten, ProPublica - September 23, 2009 12:13 pm EDT

A drill site in Dimock, Pa., taken last February. (Abrahm Lustgarten/ProPublica)
Pennsylvania environment officials have charged Cabot Oil and Gas with five violations **after nearly 8,000 gallons of hydraulic fracturing solution spilled** from a pipe system in two separate incidents near the town of Dimock last week. The department reported that a third, smaller spill, occurred at the site Tuesday morning.

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7. More Gas Contamination Affects Pennsylvania Residents

by Abrahm Lustgarten, ProPublica - August 4, 2009 1:45 pm EDT

A drilling crew move a section of steel pipe at a natural gas well site near Bradford, Pa., last August. (Robert Nickelsberg/Getty Images)
Pennsylvania environment officials are investigating another natural gas well leak, after residents near the town of Roaring Branch complained last month that rust-colored water was flowing from a spring and two small creeks were bubbling with methane gas.

The incident is the latest in a string of more than 50 similar cases related to gas drilling in the state, and comes as ProPublica published an article last week reporting that **such events were more frequent than officials said**.

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8. Dish, Texas - Interviews with residents affected by drilling

To get the gas to market requires an underground highway of pipelines and compression stations. These big internal combustion engines make noise and spew pollutants into the air day and night.
Tillman stands in a field next to the compressor complex along a fence line of trees that died after the engines moved in. His tiny town changed its name to Dish.

Dish spent 15 percent of its $70,000 annual budget on a private environmental consultant.

Mayor TILLMEN: And the air study showed extremely high levels of both carcinogens and neurotoxins, and so that's just caused us a lot of concern.

BURNETT: A memo written last week by the top toxicologist at the Texas Commission on Environmental Quality expressed concern that the presence of benzene, a potentially cancer-causing toxin detected near the compressors, could pose long-term health risks.

Ms. MEGAN COLLINS (Pediatric Nurse): We just always constantly heard the noise and constantly smelled the fumes. But every time we would ask, they would always just say that it was normal.

BURNETT: Then Collins read a newspaper story about the results of the Dish air emissions study. She says since her family has moved away from town, her symptoms have begun to ease.

Ms. COLLINS: I'm convinced, sadly convinced, that it's the emissions. I mean for doctor after doctor after doctor to tell me that I'm a mystery.

BURNETT: While Megan Collins grew sicker, something strange began to happen to Lloyd Burgess's(ph) horses. He runs a trucking company next to the compression station and he used to board horses on his property.

Mr. LLOYD BURGESS: I had a stallion here that we lost, ended up dying, had another mare in the same stall. She got a neurological defect and went blind in both eyes, had to put her down. There was a stud in the first stall down there, been here for about two years, and he got sick. I had to move him somewhere else.

BURNETT: No Dish resident has been able to prove the compression stations made them or their animals ill. For their part, the five gas companies that own the compressors have criticized the Dish air emissions study as flawed and inconclusive. They maintain their facilities do not affect public health.