Broome County Environmental Management Council

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January 11, 2011

Attn: dSGEIS Comments
New York State Department of Environmental Conservation
625 Broadway,
Albany, NY 12233-6510

RE: Comments on the Revised Draft Supplemental Generic Environmental Impact Statement (RDSGEIS) for 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

Dear NYS DEC**:**

The Broome County Environmental Management Council (BCEMC), a citizen's advisory board to County government on environmental matters, has reviewed the *Revised Draft Supplemental Generic Environmental Impact Statement (SGEIS) for the Oil, Gas and Solution Mining Regulatory Program* dated September 7, 2011.

With respect to the September 2009 draft SGEIS; the BCEMC commends you for recognizing the significant impact to wildlife and their associated habitats, recommending some mitigation, and for recognizing the significance of cumulative impacts. We appreciate and thank you for this second opportunity for comment. The BCEMC offers the comments and recommendations on the issues listed below. This letter consists of the following 3 major portions and subsections:

I. BACKGROUND
II. RDSGEIS ISSUES
- Some General Comments
- Water Resources
- Ecosystems and Wildlife
- Air Quality
- Greenhouse Gas Emissions
- Naturally Occurring Radioactive Material (NORM)
- Visual Impacts
- Noise
- Transportation
- Socioeconomic & Community Character

III. RECOMMENDATIONS

I. BACKGROUND

The BCEMC has reviewed extensive documentation about the environmental issues associated with horizontal gas drilling using high-volume hydraulic fracturing (HVHF) techniques used in Colorado, Louisiana, New Mexico, Texas, Wyoming, Ohio and Pennsylvania. Reports show that adverse environmental impacts occurred where horizontal drilling and HVHF commenced. Examples include:

1. Methane infiltration into private wells (Dimock, Pennsylvania);
2. Contamination of wetlands and streams associated with waste flow-back water (Pennsylvania);
3. Soil and plant contamination associated with accidental releases and spills, resulting in flora die-offs and livestock mortality (Texas and Louisiana);
4. Soil and ground water contamination (Wyoming);

5. Noise and habitat impacts on mule deer and sage grouse populations with already depleted and isolated breeding and wintering ranges (Colorado and Wyoming);
6. Complaints of noise pollution associated with drilling, production and delivery infrastructure (Texas and Pennsylvania);
7. Significant air quality impacts (Texas and Colorado);
8. Depletion of fresh water supplies; and
9. Impacts on rural character of communities due to the introduction of industrial activities.

The majority of Broome County's population relies on groundwater for drinking water. Like many upstate New York communities, Broome County has a history of environmental impacts from commercial and industrial activities. Both private and municipal water wells in the Southern Tier are at risk for ground water contamination due to the porous nature of the aquifers, characterized as having sand or gravel soils and frequent discharge/recharge with the streams that lie above them.

Because of pollution by organic chemicals, such as industrial solvents and other volatile organic compounds (VOCs), a number of municipal water wells in the urban area have air strippers (i.e. Endicott, Johnson City, Kirkwood, Conklin and Vestal). VOC levels have decreased due to sustained clean-up efforts by state agencies and enactment of groundwater protection ordinances by local municipalities and, fortunately, groundwater pollution has been localized. The BCEMC is concerned that pollutants discharged directly or indirectly to our water resources as a result of HVHF, may affect water quality, limiting the availability of drinking water. These pocket industrial sites in the rural landscapes could cause widespread, unpredictable, and costly impacts on rural water supplies.

Although gas exploration, production and extraction falls under jurisdiction of the Division of Mineral Resources, the magnitude of cumulative impacts that may result requires vigilant interagency cooperation between those responsible for soil, air, water, and wildlife resources. For this reason, it is imperative that all relevant NYSDEC divisions and other state agencies (including the PSC) address, monitor and regulate this activity in a coordinated and transparent manner.

II. RDSGEIS ISSUES

Some General Comments

1. The document places too much emphasis on gas and oil industry 'fact sheets' and ignores relevant peer reviewed scientific literature (Cornell study by Howarth et al being one example).
2. Despite extensive data supporting socioeconomic aspects, there is no human health assessment study documented.
3. While Chapter 10 documents issues in Pennsylvania, there is no analysis of other states. The similarities AND differences between operations, monitoring and regulation, regional shale geology, water resources, wildlife impacts, land use and community character would provide greater insight and understanding.
4. There is no failure mode analysis to assess relative safety of optional processes and/or technologies associated with horizontal gas drilling, or the future delivery infrastructure.
5. There is no statistical analysis of failures that have occurred due to this form of gas extraction in other states, or a comparison of the estimated probability of failure with proposed mitigations. This leads to a lack of insight regarding the scope and cost of mishaps necessary for estimating revenues needed to address these issues.
6. No mitigation strategy was developed to minimize future and/or large-scale impacts related to full build-out scenarios. It is imperative to understand potential threats to local natural resources resulting from the substantially large number of closed wells in the future. How do we know that closed, capped, and non-producing wells will not cause contamination in 10, 50 or 100 years? In other words, what is the lifetime and failure rate of the cement casings and other parts of the closed well over time?
7. As stated in our previous comments, the full build-out scenario suggests significant impacts to air quality, noise and habitat degradation due to the development of compressor station and pipeline infrastructure. Ignoring these known impacts represents segmentation to the greatest degree. Geological implications associated with removing large volumes of natural gas and fracturing of the Marcellus shale layer over a wide area need to be considered.

8. There is no substantive improvement to the geologic studies (chapter 4) since the original 2009 draft. The chapter does not provide data showing how poor vertical shaft casings contribute to methane migration to local water supplies. The mechanisms responsible for this should be documented. For example, do we know when the methane migration occurs, after the vertical bore and casing are done, or after the fracturing activities have occurred? How does variation in methane concentration change as you move away from the suspect well? How do we know that there is no biogenic methane migration directly to the atmosphere when no methane migration is detected in nearby water wells? Does the concentration change with respect to the direction of the horizontal drilling bores? Will extraction of a significant portion of the natural gas in a region provide the opportunity for fault creation or other geological changes leading to contaminant transport as the over-pressured shale becomes hydrostatically pressured with the loss of the embedded gas? Do other volatiles (either introduced during drilling or naturally occurring) migrate with the methane? Does the fact that the shale is no longer a solid layer have any future consequences?

   Full understanding of the pertinent geologic processes for all formations, including shale, is crucial for understanding the near and long term impacts of such large scale drilling as this. This is even more pertinent when considering the possibility of further extraction from other formations such as Utica Shale. Chapter 4 states that natural seismic activity will not affect the horizontal drilling, and that horizontal drilling will have no seismic impact on other activities or property. Yet, in Online Chat remarks from October 8, Commissioner Joe Martens states that drilling will not occur within 1000 feet of public water infrastructure to prevent damage "through seismic vibrations". Therefore, the minimum setback from private homes should also be 1000 feet to protect footers, foundations and slabs. Chapter 4 also suggests that fracturing fluids cannot reach aquifers simply because the saline deposits have never migrated to the aquifer through impermeable shale formations. This ignores the possibility of creation of new transport pathways resulting from larger scale fracturing and gas extraction. Gas industry representatives, on the other hand, state that fracturing fluids remaining in the shale cannot migrate upward to cause contamination because they are absorbed by the shale. This information is conflicting and should be clarified. It would be useful to note the similarities and differences for transport mechanisms for fluids and volatile substances.

9. The document's proposed setbacks relate only to water resources. Assessing setbacks required for all resources, along with the setbacks to protect people and property from accidents, and then using the greatest distance to defining the setback from adjacent properties, would be a more comprehensive approach. The RDGEIS prohibits HVHF within 500 feet of private water wells. While we view this as inadequate, we also note that the document does not address setbacks from residences or public buildings NOT serviced by private wells. These structures, it seems, are then governed by ECL 553.2 which specifies unrealistic setbacks of 100 and 150 feet respectively. As noted in item 8 above, a setback of at least 1000 feet for ALL private and public buildings, no matter what water source is used, would be a more comprehensive approach.

10. Discussions regarding 'greener' technologies for horizontal drilling are not given adequate attention. Even if they do not extract gas as effectively they may be more attractive by reducing environmental risk.

11. There is no analysis that compares gas drilling in tight shale formation with alternative energy strategies, either in renewables or energy conservation/efficiency: advantages, disadvantages, return on investment, etc.

12. Although the sheer number of comments provided on the first draft would make it challenging, it is unfortunate that this latest draft did not include responses to the comments submitted during the first draft. This would have facilitated the refinement of the discussion as well as the document itself.

Water Resources

1. There is no apparent scientific basis for the setbacks associated with water resources. We would expect different setbacks for surface water and ground water resources; however, the RDSGEIS does not provide any data to explain the proposed setbacks. Why would a setback for a private well be 500 feet while a public well setback is 2000 feet? What characteristic of a private well makes it less susceptible than a public one?

2. The 4000 foot setback for the Syracuse and New York City watersheds is rationalized by stating that they are unfiltered water supplies. Many rural homes rely on natural springs and the vast majority of wells in Broome County are also not filtered. In addition, filtering will not remove dissolved contaminants such as salts and many chemicals associated with horizontal gas drilling. All municipal water treatment systems are equally susceptible to these threats and thus face similar additional expense in the event that their watersheds are threatened. Again, the scientific basis for these setbacks is not documented.

3. Setbacks for wetlands of all sizes are inadequate. Flooding, as recently experienced in the Southern Tier region, could be alleviated to some extent by protecting and improving all wetlands. Wetlands help to filter ground water that feeds into local drinking supplies.
4. The heavy rain events leading to local flooding increase the risk of substantial erosion and landslides, particularly if intensive logging or land clearing occurs on steeper slopes. For this reason establishing drill sites or the associated delivery infrastructure on heavily wooded slopes or steep terrain should be prohibited.
5. While perhaps beyond the scope of this SGEIS, the reality that this drilling technology in its current form effectively removes fresh water from the global water cycle should be considered. Fresh water is lost forever, and the impact may be dramatic as this form of drilling expands worldwide. This is yet another reason to seriously push for 'greener' drilling technologies.

Ecosystems and Wildlife

1. While the SGEIS has acknowledged significant impacts to wildlife and habitats, and has recommended best practices for forests, grasslands and control of invasive species, these are just recommendations and should be required by regulation. Furthermore, recommended best practices for forest and grasslands are not documented in detail and should be part of the RDSGEIS content.
2. The best practices for forests apply only to tracts of 150 acres or more, or 30 acres or more for grasslands. However, it is not clear if this applies only to tracts that lie within the proposed pool of the drill site, or only on the leased property containing the drilling site, or if this applies to any tract of 150 (or 30) acres that crosses these arbitrary, man-made borders. These practices should apply to contiguous tracts whether they are within any particular boundary or not.
3. It may be prudent to consider the diversity of woodlots covering 50 acres or more, if they contain old growth trees or have other unique characteristics.
4. Higher quality grasslands of 20 acres or more may be of more value than some covering 30 acres or more. It is recommended that a biological assessment be made before requiring best practices and that a 20 acre threshold be considered.
5. A requirement for best practices within only the forest and grassland focus areas is short sighted. For example, virtually all grassland bird species, and not just the Henslow's Sparrow, are declining dramatically across virtually every state, as shown by Breeding Bird Survey data. Thinking globally, rather than just locally, would be a more meaningful strategy.
6. Noise impacts (chapter 6, section 10) are discussed only in the context of human impacts and do not consider wildlife impacts. Best practices for ecosystems and wildlife should include appropriate setbacks, locations and noise mitigations for drilling operations, as well as the on-going operations in the form of compressor stations both on the pads and the required booster stations as well as the periodic servicing of the sites.

Air Quality

1. Chapter 6, section 5 documents a comprehensive review of air pollution sources and mitigations through changes to processes and use of alternative fuels. Considerable dispersion analysis is also documented. However, the distance required to assure that dispersion lowers concentrations for airborne pollutants to safe levels is not documented. A comparison of these distances before mitigation and after is warranted to prove effectiveness. Further, these distances define appropriate setbacks from an air quality perspective. These should be documented, and if greater than those distances associated with water resources, these should take precedence.
2. As in other sections, there is no attempt to ascertain a cumulative impact of a system of wells to include methane migration along with other volatiles (either those introduced or naturally occurring) that have the potential to migrate with the methane
3. It is not clear if the dispersion analysis considers worst case conditions of highly stable air (i.e. cloudy, calm summer days or calm, clear winter nights). These capture events when air quality concerns would be greatest.
4. There is no analysis, on a site-by-site basis or cumulatively, determining or identifying reactive by-products associated with natural gas production and delivery and their impacts upon local air quality. For example, what

level of ozone production may occur and what mitigations would be employed if necessary to meet federal air standards?

Greenhouse Gas Emissions

Studies suggest that rogue methane emissions from leaky wells, piping and pipelines, well venting and biogenic methane migration make natural gas extracted with this technology as dirty as coal with respect to greenhouse gas emissions. In 7.68 of the RDSGEIS, DEC proposes a mitigation plan to address this. How will DEC determine if there is any biogenic methane migration if not reported by neighboring residences who find it in their water? How will DEC measure leaking at the well site or other infrastructure? If DEC is planning to be proactive and address this aspect of the infrastructure, why can't they assess other cumulative impacts of this post-drilling activity?

Naturally Occurring Radioactive Material (NORM)

1. All radioactive wastes should be buried at a depth appropriate for their level of radioactivity and at a site licensed to handle this form of waste.

2. Are there radioactive sources other than the Marcellus shale exposed by drilling?

Visual Impacts

1. One short term visual impact is light pollution associated with flaring. Allowing this only during daytime hours is likely the best mitigation.
2. The greatest long-term visual impact is clearly land clearing for pipelines and compressor stations. Controlling the build-out locally is the only effective mitigation.

Noise

1. As stated previously, noise aspects need to be considered for their impact on wildlife.
2. The distance from a site where noise levels are at an acceptable level, with and without noise mitigating strategies in place, defines another set of setbacks with respect to residences, businesses and wildlife habitats.
3. DEC should define proper and effective noise regulations, rather than expect municipalities to address this on their own, unless they are willing to allow municipalities to apply other regulations to the industry. Has DEC authored any noise regulations for any other activities? If yes, can these be applied to this industry as well?
4. Given that noise becomes an "esthetic" judgment after health factors are addressed, should not a local community be allowed to apply stricter regulations if they see fit to do so.

Transportation

1. Trucks carrying hazardous chemicals to a drill site require special licensing. Waste leaving the site, both flow-back waste and those containing NORM must also be transported as hazardous waste. DEC (or another NYS agency) must ensure that it safely arrives at its proper destination.
2. Page 17-7 allows for burial of trash or pit liners on site. This is an accident waiting to happen. All waste must be transported from the drilling site. Private property, like our parks, should be "carry in, carry out".

Socioeconomic & Community Character

1. The RDSGEIS relies upon gas industry favored "modeling" studies that are notoriously inaccurate. While providing a wealth of data suggesting positive impacts of gas industry activities on revenue, these models routinely ignore negative consequences and costs. Both sides of the coin must be shown to assess the full impact. For example:
   - Gas drilling, or simply signing of a lease, may be grounds for a bank to pull an existing mortgage or deny a new one. What is the overall impact upon the housing market and household lending as a consequence?

- In the event of an accident affecting someone's property, whether water, buildings or land, how will the impacted person be compensated? Where will the funding for this come from?
- Negative impacts on other sectors of our economy like tourism, agriculture, hunting and fishing, wineries, etc.
- What is the impact upon local property values in light of negative perceptions and real accidents? What will the consequence be on the local tax base?
- If a farmer receives an agricultural exemption on property taxes signs a lease, has a well drilled and starts receiving substantial royalty income, will they continue to receive an agricultural tax break? Should they? Policy should promote and otherwise encourage agricultural enterprise.

2. One aspect largely ignored is markets for the extracted natural gas. Upstate may be incurring environmental risk for the sake of energy markets downstate and elsewhere. One disadvantage that the Southern Tier faces when competing for business is the high cost of energy. If transportation of energy products is a significant portion of cost, why isn't there any assessment of the potential benefits of selling natural gas locally, minimizing the transportation expense? If 'our' natural gas resource could make us more competitive across a wide range of businesses then there may be a more compelling reason for accepting the environmental risks.
3. In the interest of true environmental justice, water-based setbacks should be based on science providing all citizens of the state the same protections.
4. Local municipalities use planning and zoning tools to realize their vision for local community character. By denying municipalities control over where drilling occurs the state will, for all intents and purposes, become an industrial zone, limiting the effectiveness of these tools. According to section 8.1.1.5, the DEC will notify Towns of permit applications and do more detailed investigation when there are conflicts with local land use plans. DEC should not issue any permit until it gets a formal response stating that the municipality considers a drilling application acceptable under existing planning and zoning.
5. There is a wealth of good data to be gleaned from the numerous "comparative" economic studies that suggest that the long-term economic vitality of any area that engages in gas drilling (or similar extraction) activity is eroded and their competitiveness is greatly diminished. More recent studies have now documented how and why this occurs. It is suggested that the DEC avail themselves of such studies to better understand the true socio-economic impacts of gas drilling.

III. RECOMMENDATIONS

Before permitting any high volume horizontal drilling, it is imperative that potential long-term issues be addressed. To minimize the impact of potential failures, an assessment of all technologies and processes associated with gas well development and the delivery infrastructure must be reviewed and mitigation policies developed. This must include a failure modes analysis quantifying the probability of failure in a reasonable and conservative manner. "Greener" methods and materials, such as propane-based fracturing should be considered more seriously.

In Broome County, it was only recently discovered that chemical solvent spills from years ago resulted in health issues due to the phenomena known as vapor intrusion. We need to recognize that unforeseen exposure pathways NOT envisioned today may be identified or understood sometime in the future. The evaluation of the potential for future aquifer contamination by fracturing solution chemicals would be prudent based upon data and analysis presented in the dSGEIS stating that, at best, two-thirds of the fracturing solution is never recovered. No quantitative assessment is presented that precludes the possibility of future aquifer contamination by residual chemicals, or by mobilizing naturally occurring contaminants. The potential long-term impacts of future seismic activity (8% probability of '*significant'* seismic activity every 50 years) or potential failure of well capping technology on the connectivity between aquifers and the Marcellus shale must be addressed, and abatement measures to mitigate future or long-term contamination must be developed.

A full build-out analysis that includes combined impact from all forms of gas drilling and transportation must be conducted. Many of these impacts can be readily mitigated by establishing setbacks between 'adjacent' drill sites, establishing approved roadways for truck traffic, planning and selecting the lowest-impact pathways for pipelines, and ensuring that 'adjacent' well sites are not developed concurrently. These requirements, in conjunction with individual setback requirements and 'best practices' required of the industry, will go far to mitigate these broader-based and long-term concerns. Further, extended drilling, in addition to the dSGEIS recommendation of

maximizing the use multi-well pad sites, should be encouraged. The resulting larger spacing pools, as noted in the dSGEIS, would reduce the effective drilling footprint in a locality, helping to reduce the cumulative impact.

The best practices suggested for mitigating the impact of horizontal gas drilling on wildlife and their habitats must be mandatory and exercised everywhere, and not just in focus areas

No quantitative standard is established for noise pollution associated with the drilling operation or the delivery infrastructure. A mitigation plan for noise abatement must address noise from the drilling operation, water extraction activities, the increased local trucking, and the future delivery infrastructure. The noise impacts must be understood both for human quality of life and for local wildlife. The mitigations should include daily hours of operation and setback requirements for residences and wildlife for all phases of gas development and delivery. It should also allow local communities to set stricter limits if the nature of that community warrants them. For example: noise in rural areas is much more noticeable in the evenings and would change the character of the community.

Setback requirements for specific water resources must be equitably established everywhere. All New York citizens' water supplies are due equal protection. Water extraction from aquifers that may compromise water supplies must be prohibited. There must be a requirement that damage to public or private water supplies due to pollution or diminution be corrected, or the water supply replaced.

Overall setbacks with respect to public areas and private residences should be established by selecting the greatest setback from those established for water protection, air quality protection, noise abatement, and sphere of influence any drilling activity related accidents (such as blow-outs, explosions, trucking accidents and spills).

The DEC should conduct a Regulatory Impact Assessment to address staffing and oversight and include this assessment as part of the RDSGEIS. The BCEMC still expresses concern over the number of inspectors available for the frequency and level of oversight, as well as the quality and types of training. Effective training of personnel *must* encompass the evolving varieties of issues arising with horizontal drilling techniques as opposed to vertical drilling. Therefore, it is recommended that the DEC consider creative methods for ensuring affordable and effective policing of the exceptionally large scope of activity expected with horizontal drilling.

Standards for defining unacceptable and unsafe concentrations of pollutants associated with gas drilling and gas delivery must be developed, based on science. Total pollutant concentrations from multiple pollutants should be no greater than the minimum acceptable concentration for any one of the pollutants in question. This is necessary since risk assessment to human health is determined one pollutant at a time. The impact of exposure to multiple pollutants is not understood, so a conservative approach should be adopted.

Cumulative and sometimes indirect impacts stemming from hydraulic fracturing have the potential to impact communities for years to come. As part of the RDSGEIS, the DEC should advocate for the State Health Department to conduct an independent, comprehensive Community Health Impact Assessment specific to the oil and gas development industry before drilling permits are issued to address air, water, and soil issues (potential contamination), but also social environmental justice concerns.

The DEC should update the revised drilling EAF (Mining Environmental Assessment Form) even further to include more useful and relevant information about environmental and social conditions related to horizontal drilling so that reviewers can make better-informed decisions.

CLOSING

We hope that you find the comments regarding the RDSGEIS and the recommendations provided herein to be constructive and useful input for finalizing the RDSGEIS's content and in preparation of the Responsiveness Summary. We recognize that development of the Marcellus Shale gas resource, and other similar low-permeability shale resources, can provide enormous opportunity for New York, but not without very real risks to other natural resources, natural beauty and to New York's citizens' that must be fully understood and quantified. It is our hope that the final regulations for this industrial activity will provide concrete protections for all, based on sound science and a complete understanding of that science, and will ensure that best practices are not relegated to the negotiated lease contracts of local coalitions. All of New York's citizens, no matter their position on this issue, and our future generations equally deserve the best stewardship of our natural resources that we can provide.

We look forward to reviewing the Responsiveness Summary and final SGEIS and thank you for your ongoing efforts to protect New York's environment, including its air, land, water and wildlife resources, and ultimately, human health and quality of life in New York.

Yours Sincerely,

André LaClair
(Electronically signed)

André G. LaClair
EMC Acting Chairman

AGL & BAE

cc:
D. Preston, Broome County Executive
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J. Marinich, BC Legislative Chair
E. Miller, Commissioner, BC Planning