Broome County Environmental Management Council
Barbara J. Fiala, Broome County Executive • Stacy Merola, Director

Broome County Office Building • 44 Hawley Street • P.O. Box 1766 • Binghamton, New York 13902
(607) 778-2116 • Fax (607) 778-6051 • Website: www.gobroomecounty.com

December 31, 2009

Attn: dSGEIS Comments
Bureau of Oil & Gas Regulation
NYSDEC Division of Mineral Resources
625 Broadway, Third Floor
Albany, NY 12233-6500

Email: dmnsgeis@gw.dec.state.ny.us

RE: Comments on the Draft Supplemental Generic Environmental Impact Statement (SGEIS) 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 Bureau of Oil & Gas Regulation**:**

The Broome County Environmental Management Council (BCEMC), a citizen's advisory group to County government on environmental matters, reviewed the *Draft Supplemental Generic Environmental Impact Statement (SGEIS) for the Oil, Gas and Solution Mining Regulatory Program* (dSGEIS) dated September 2009.

The BCEMC commends the DEC for incorporating a collection of complementary data and analysis into the dSGEIS, including the review of the processes, materials and technologies associated with horizontal drilling and high volume hydraulic fracturing. We appreciate and thank you for this opportunity to comment.

We offer background information for perspective and categorize topics of concern for your consideration as you evaluate and prepare a Responsiveness Summary for the SGEIS.

BACKGROUND

The BCEMC researched and reviewed extensive documentation and reports about environmental issues associated with horizontal gas drilling using high-volume hydraulic fracturing techniques used extensively in Colorado, Louisiana, New Mexico, Texas and Wyoming, and to a lesser extent in Ohio and Pennsylvania. Reports show that adverse environmental impacts occurred in areas where horizontal drilling and high volume hydraulic fracturing commenced. Examples include:

1. Methane infiltration into private wells in Dimock, Pennsylvania;
2. Contamination of wetlands and freshwater streams in Pennsylvania associated with waste flow-back water from horizontal drilling operations;
3. Soil and plant contamination associated with accidental releases and drill site spills, resulting in flora die-offs and livestock mortality in Texas and Louisiana;
4. Soil and ground water contamination in Wyoming;
5. Noise and habitat impacts in Colorado and Wyoming for example, that drive mule deer and sage grouse populations, which are in decline from already depleted and isolated breeding and wintering ranges;
6. Significant air quality impacts in the vicinity of drilling, production, and delivery operations in Texas and Colorado;
7. Depletion of fresh water supplies in arid regions of some western states;

8. Complaints of noise pollution associated with gas drilling, production and delivery infrastructure in Texas; and
9. General decrease in quality of life for traditionally rural communities due to the introduction of industrial activities.

Like many upstate New York communities, Broome County has a history with pollution impacts from commercial and industrial activities. Many private and municipal water sources in the Southern Tier are at risk for ground water contamination due to the porous nature of the unconsolidated aquifer in the river valleys. These aquifers are characterized as having sand or gravel soils and frequent discharge/recharge with the streams that lie above them. Bedrock aquifers common in rural areas of Broome County tend to be hydrologically isolated from large streams and hold water in bedrock fractures rather than in sand or gravel deposits.

Because of this interrelationship, the BCEMC is concerned that pollutants discharged to our streams, wetlands, lakes and ponds, directly or indirectly, may affect groundwater quality as well.

Because of pollution by organic chemicals, such as industrial solvents and other volatile organic compounds (VOCs), a number of municipal water supply wells in the urban area have air strippers. In particular, Endicott, Johnson City, Kirkwood, Conklin and Vestal all have had treatment systems installed on at least one of their wells. VOC levels have decreased greatly in recent years in response to sustained clean-up efforts by state agencies and the enactment of groundwater protection ordinances by local municipalities. Fortunately, groundwater pollution has been localized affecting only small areas in Broome County. With pocket industrial sites on the rural landscapes, the region could experience widespread negative impacts on rural potable water supplies that could be unpredictable and costly to remediate.

Although gas exploration, production and extraction falls under jurisdiction of the Division of Mineral Resources, the sheer magnitude of potential cumulative impacts resulting from this type and extent of gas exploration and production necessitates vigilant interagency cooperation with those whose responsibilities address soil, air, water, and wildlife resource quality and protection. For this reason, it is imperative that all divisions and bureaus of not only the NYSDEC, but of other relevant agencies address this subject in a coordinated and transparent manner.

Considering the aforementioned, the BCEMC offers the comments and recommendations organized into the following sections:

I. GENERAL INADEQUACIES

Despite the DEC's incorporation of air quality analysis, geologic studies and the comprehensive description of the horizontal drilling process, there are unresolved issues and inconsistencies within the dSGEIS that must be fully analyzed and addressed to maximize environmental protection and human safety.

- The general tone of the dSGEIS is to "*recommend*", "*encourage*", "*plan*", or "*consider*" specific practices and processes, rather than mandate specific operation standards or regulations for the industry.
- The dSGEIS lacks analysis of potential ecosystems impacts.
- There is no mitigating strategy cited for minimizing future and/or large-scale impacts because of full build-out scenarios for drilling operations and related delivery infrastructure.
- Finally, there is no evidence of any failure mode analysis to assess the relative safety of optional processes and/or technologies associated with horizontal gas drilling, high-volume hydraulic fracturing or the future delivery infrastructure.

Regarding failure mode analysis, recent news reports indicate that over the past 30 years in NY there were 270 incidents associated primarily with vertical gas drilling among approximately 14,000 wells statewide. Recent horizontal drilling and high-volume hydraulic fracturing in PA yielded nearly a half dozen serious incidents with roughly 100 horizontal wells permitted, let alone drilled. First-hand observation of these well sites does not show any practices that categorically would not be permitted according to the dSGEIS.

In the aircraft industry, failure mode analysis is conducted to demonstrate that any single component failure has a probability of less than one in one billion of causing an accident. Despite this technological mandate, aircraft crash often as the result of human error and/or unforeseen meteorological events. It is only appropriate that the gas drilling industry that uses harmful products be regulated with the redundancy and with the safest methods, every time and everywhere, to render environmental catastrophes extremely improbable.

COMMENTS ON DSGEIS CONTENT

Cumulative Impacts

1. The assumption that development of natural gas resources serves the public interest is questionable [dSGEIS p. 2.2]. Debate is hindered by lack of good analysis of the cumulative effects of unconventional gas drilling.

2. Sprinkled throughout the document are references to cumulative effects and their importance and relevance. "*Though the potential for severe negative impacts from any one site is low, when all activities in the State are considered together, the potential for negative impacts on water quality, land use, endangered species and sensitive habitats increases significantly*" [dSGEIS p. 6-141]. Planning and preparing for cumulative affects of an action or a set of actions cannot be understated in this instance given the scope and magnitude of current and future natural gas plays in New York and adjacent states.

3. The one section focusing on cumulative effects is mostly devoted to discussing how difficult it is to do such an analysis [dSGEIS p. 6-143-6]. The section lacks substance; this is especially disturbing because a generic environmental impact analysis is done to avoid doing impact analyses on individual drill sites.

4. Difficulties in ascertaining cumulative impacts aside, DEC had no reservations incorporating estimates of cumulative economic "*benefits*" with very specific numbers of wells [dSGEIS p. 2-6]. These projected economic benefits expressed in dollars do not attempt to identify how many of these dollars actually flow into and stay in the community. The economic model used in the analysis is simply too crude to make such distinctions, yielding numbers of little value. No attempt was made to identify external costs.

5. Review parameters [section 3.2.1] must consider location of well site in context of potential delivery location and infrastructure required. This amplifies well site impacts on local ecosystems.

6. It is unacceptable that the DEC will not provide any oversight of industrial sites (i.e., compressor stations) in rural or agricultural areas. Also unacceptable is that there is no impact assessment of the fragmentation created by future pipeline infrastructure. [dSGEIS, section 5.16.8, paragraph 3]

7. Regarding Article VII of NY Public Service Law [dSGEIS, section 5.16.8.1], what ensures that collectively the DEC and the Public Service Commission (PSC) proactively begin an environmental review now, and if not, why?

8. The ICF findings [dSGEIS, 5-150] regarding the probability of contamination by fracturing fluid ignore the geological data cited previously in the dSGEIS, and these findings ignore the fact that the majority of the fracturing solution is never recovered.

9. The one difficulty cited that we concur with is "*that it is not possible to define the threshold at which development results in adverse noise, visual and community character impacts. Some people will feel that one drilling rig on the landscape is too many, while others will find the changes in the landscape inoffensive and will want full development of the resource as quickly as possible. There is no way to objectify these inherently subjective perspectives*." The document continues, "*Accordingly, any limitation on development, aside from the mitigation measures discussed in the next chapter, is more appropriately considered in the context of policy making, primarily at the local level*" [dSGEIS p. 6-146].

   One of the more disturbing aspects of this proposed activity is the disregard and circumventing of local land-use planning. Local planning entities determine where industrial activity is most appropriate and acceptable. The community made these decisions, as the document points out, at the "*most appropriate level*" the local level. People bought property and built homes based on these land use decisions. A return to upholding and respecting local land use planning is welcome.

10. The Marcellus Shale is acknowledged to be a "sheet/blanket" formation with 98% success rate and cannot be compared to the wells drilled in 1985 that were into a limited number of pools or reservoirs and thus had a very low success rate [dSGEIS p. 6-145]. This acknowledgement conflicts with DEC's argument that an analysis of cumulative effects is difficult, if not impossible. The gas companies have very good knowledge of the location of the gas resource, know what lands they want to lease for drilling, and know what markets (and where those markets exist) it wishes to deliver its product, and therefore have ample information on which the DEC could assess cumulative effects.

11. We continue to suggest, as we did in our scoping comments that the DEC work with the gas companies to develop a full build out model of the potential Marcellus gas field, including temporary roadways, pipelines, well pads and staging areas based on setback requirements and geographical constraints. Such a plan should encourage larger spacing units with joint partnerships and more centralized drill sites with longer horizontal runs off of single vertical well bores thus reducing the number of times the aquifer is compromised and the chance of problems occurring. Such a practice, at the same time, reduces the surface footprint as well. Both resources and earnings would be pooled, but proportioned according to mineral rights secured on a per acre basis. Longer horizontal runs could increase the chance that local land use planning could be respected and accommodated

12. A full build out model would determine an appropriate rate of development from an impact perspective, not to be accelerated. Economics, of course, could prescribe a slower rate of development [dSGEIS p. 6-145].

13. Segmented review greatly impedes DEC's ability to assess cumulative impacts. Impacts from water withdrawal, water treatment, and collection infrastructure, among others, are not analyzed making it impossible to comprehensively assess environmental impacts; this could be viewed as a segmentation of the suite of actions.

14. A generic environmental impact analysis is done to avoid the prospects of doing an impact analysis on each individual drill site. If cumulative impacts are not analyzed and addressed within the dSGEIS, where will they be addressed? If not now, when? Certainly, this effort is needed before we give any thought to the granting of permits.

15. The SGEIS claims that all negative impacts from gas drilling are short term in nature. This is certainly NOT true if gas production and delivery impacts any old growth forests. Further, potential exploitation of public lands must be evaluated to determine if the loss of public resources (wildlife, ecosystems, recreational opportunities, etc.) is sensible in light of the reasonably anticipated gas resources being explored, extracted and distributed.

16. Phased permitting and control of the rate of development may be required to mitigate cumulative and significant air quality issues associated with gas production.

17. The regional cumulative impacts conclusion is inadequate [dSGEIS, section 9.2.2]. It should not require any extraordinary vision to assess gas production and delivery impacts on regional resources both in the short and long terms. The potential air, soil and water impacts are already documented in the SGEIS, and wildlife issue such as habitat fragmentation, noise and tower impacts are reasonably well understood so that that planning to mitigate these impacts is not an unreasonable expectation.

The dSGEIS states that it is essentially impossible to predict the full gas resource development in a region. However, at the same time, it also points to the development of gas resources in other states and plays, and notes that most wells drilled are ultimately economically viable. Although DEC explains at length in the dSGEIS the delineation of responsibility from well development to gas production and delivery between DEC and the PSC, the DEC and the public ultimately will have to deal with any consequences. The gas companies know where they want to drill and where they have signed leases, and the leased parcels are public knowledge. It is imperative that the gas companies, DEC and municipalities work collectively to minimize the "full build-out" impacts of regional drilling and gas production. It does little good to responsibly site drilling operations, including the use of multiple-well drill sites if the ensuing pipelines and compressor stations ultimately zigzag across the open spaces that were protected by careful drill pad citing. Fragmentation is already a serious ecosystem problem, with amply sized forest tracts and grassland spaces necessary for biodiversity already stressed by more traditional forms of development.

Water Quality

1. The dSGEIS states that private wells and springs should be used as drinking water sources only as a last resort. The DEC should know that a great deal of the proposed activity will occur in areas where such wells are the only practical option. While recognizing their susceptibility to contamination, the only suggested remediation it a 150-foot setback from the wellhead. There seems to be no coherent reason for this footage. There is no assessment as to the effectiveness of this effort [dSGEIS p. 2-24].

2. Drinking water standards only protect against known or anticipated contaminants and therefore will not guard against chemicals that are not historically anticipated to be in drinking water. Yet, DEC will not make chemical contents public [dSGEIS p. 2-12].

3. Inappropriate reliance on the fact that "*No documented instances of groundwater contamination are recorded in the NYSDEC files from previous horizontal drilling or hydraulic fracturing projects in New York.*" The DEC acknowledged it has never looked [dSGEIS p. 2-26]. This statement is irrelevant since this dSGEIS is about high volume hydro fracturing and horizontal drilling.

4. Well water testing recommendations [dSGEIS p. 5-154] do not recommend testing for a number of the most dangerous chemicals used in the fracturing solutions.

5. While methane is identified as a contaminant of concern, no testing protocol is put forth [dSGEIS p. 7-41].

6. Local health departments are identified as the responsible party for addressing and investigating water contamination, yet there is no assessment of their ability to address the significantly increased workload [dSGEIS p. 7-42]. A regulatory impact assessment as done for other significant revisions to rules and regulations could address this impact to local health departments and other agencies called to task.

7. The dSGEIS states that other potential causes would have to be ruled out before water contamination cases are referred back to DEC. If no problem existed before the drilling activity and a problem is then reported, it would seem logical, more efficient, and timely to assess whether the problem resulted from the drilling activity before moving on to other possible causes [dSGEIS p. 7-42].

8. There is no discussion of impacts of the 4000 identified wells ready for plugging or the estimated 40,000 unidentified abandoned wells [STRONGER survey of NY 2006]. Yet the dSGEIS notes at Appendix 11, p. 31, "*It is theoretically possible but extremely unlikely that a flow path such as a network of open fractures, an open fault, or an undetected and unplugged well-bore could exist that directly connects the hydraulically fractured zone to an aquifer.*" SEQR says that when determining significance of actions that the probability of one negative impact, however small, must be evaluated further.

9. There exists a lack of distinction between drilling waste, flowback wastewater and produced water/waste. Incomplete understanding of composition of any of those wastes. DEC has not tested these wastes [dSGEIS 5-101, 6-18, 7-34, 7-50], nor do they have any idea of potential volumes [dSGEIS p. 7-90]. However, the DEC hopes that by the time the dSGEIS is finalized industry (in the form of the Marcellus Shale Committee and the Appalachian Shale Committee) will make data about flowback waters public [dSGEIS p. 7-96].

10. Water treatment plants are left to their own devices to determine what kind of wastes they receive. "*It is incumbent upon the Publically Owned Treatment Works (POTW) to determine whether the volumes and concentrations of chemicals present in the flowback water or production brine would result in adverse impacts to the facility's treatment processes as part of the above headworks analysis*." [dSGEIS 7-59]. Again, the environmental impact of this activity is not taken into account. Will the POTWs be expected to adequately treat wastewater if they are not privy to the chemical contaminates in that waste?

11. All trucks carrying flowback waste from a drilling site must be monitored to ensure that all of what leaves a well site reaches the disposal or recycling site. [dSGEIS, section 5.13.3.4] An instance of wetland and stream die-off in southwestern PA has been associated with illegal dumping of flowback waste.

12. Road spreading of "produced water" is allowed although no distinction is made between the differing kinds of wastes. The DEC acknowledges no testing has been done. Not all Flood Zone maps are up to date so this may not provide adequate protection against flooding of gas wells or open pits. [dSGEIS p. 2-35] Yet, severe flooding is acknowledged as a problem [dSGEIS p. 6-42]. Is the reader to conclude that local governments are expected to "consider" this problem?

13. Only brines extracted before any fracturing activity at a well, and proven NOT to contain any radioactive materials, should be considered for road use to eliminate potential chemical and radiation contamination along roads. [dSGEIS, section 5.16.6]

14. Failure to address large-scale water withdrawals. "*The concern for aquifer depletion due to increased ground water use in New York is being reviewed and addressed by the DEC*" [dSGEIS p. 7-6], but why not in this dSGEIS?

15. The only discussion of recycling or conservation of water is the note that "*it is beneficial to the operators to implement water conservation practices.*" [dSGEIS p. 7-78]. The dSGEIS should be specific.

16. Storm water permits need to be revised, but have not been yet and inspections and documentation of storm water permits is apparently left up to local governments [dSGEIS p. 7-25].

17. Large centralized impoundments of flowback waste would not be subject to the same regulations as ponds of fresh water [dSGEIS p. 6-38]. Liner requirements will be the same as for landfill leachate, but "*as with all environmental containment systems, it is acknowledged that conservative liner requirements alone do not guarantee groundwater protection. Emphasis has to be placed upon facility design . . ....to best ensure successful protection of the groundwater*" [dSGEIS p. 7-52]. However, none of the "*emphasized*" items are required. In fact, the DEC points out that above ground storage tanks are preferable, but they do not require them. [dSGEIS 7-55]

18. The dSGEIS notes that the region receives more precipitation than evaporation [dSGEIS, p. 2-31], but fails to address the implications of what this means for open pits collecting rainwater. The dSGEIS states that pits may be used for up to three years [dSGEIS, p. 6-56].

19. If flowback impoundments are used, the dSGEIS states that it will be necessary to exclude certain solvents and surfactants containing benzene and xylene from fracking fluids [dSGEIS p 7-89]. Yet benzene appears to occur naturally in the Marcellus shale and will be present in the flowback whether it is added as a solvent or not.

20. Despite the fact that "*these larger off-site impoundments have the potential to qualify as a major source of Hazardous Air Pollutants (HAPs) due to certain chemicals*" the DEC plans to allow them although maybe, it might require, in some instances "*a physical barrier to public access at least 500 feet from the well pad.* This will happen only if the applicant is not able to show that specific control equipment will be used to further reduce particulate matter emissions during hydraulic fracturing operations [dSGEIS p. 7-89].

21. It is possible the water in these flowback pits will be contaminated with radioactivity, yet no studies have been undertaken [dSGEIS p. 7-103]. DEC notes that someone (it does not say who, when or how) should take sampling, analysis, and surveys after production begins and determine what radioactive material licenses may be needed.

Air Quality

1. Air pollution generated by existing gas fields is a growing concern. Emissions can turn a rural community with good air quality into one with air quality resembling a good-sized city. Emissions emanate from a variety of sources. The more obvious ones include the high volume of trucks hauling equipment, material and workers to and from sites; equipment emissions (drill, pumps, compressors, separators, etc.); flaring; and evaporation off the mud ponds that collect drill dregs and recovered fracturing fluids. There are no mandated mechanisms to mitigate these potential air impacts.

2. There is a growing concern over the off gassing of methane and other volatiles from well sites and collection infrastructure. This is more difficult to study given the pattern of denial exhibited by the oil and gas industry. This area needs focus in the dSGEIS before moving forward.

3. Reliance on Penn State/industry data that natural gas development will reduce Greenhouse Gas Emissions is erroneous [dSGEIS p. 2- 6].

4. The description of the use of lined pits for wastewater storage [dSGEIS, section 5.11.1.2] indicates not only a potential contamination path to soil and ground water, but to local air quality. Open pits provide a convenient pathway for volatile chemicals to enter the local air masses.

5. Air quality analysis [dSGEIS, section 6.5] does not conclude with any applicable setback requirements for well sites or ensuing compressor stations. Table 6.21 [dSGEIS p. 6-104] provides a hint at applicable setbacks. Further, there is no assessment of the community-wide air quality impacts associated with large-scale truck traffic related with horizontal drilling.

6. The last bullet regarding flowback water surface impoundments [dSGEIS section 6.7] implicitly implies a safe setback of approximately 3300 feet. This setback strongly suggests that these impoundments are a safety issue and therefore should not be allowed.

7. To its credit, DEC helpfully points out that well operators could limit generation of carbon dioxide by limiting vehicle miles traveled. It also suggests participation in the voluntary STAR program [dSGEIS p. 7-92]. Again, all good points, but in the end DEC only "*encourages*," not requires.

Noise Pollution

1. In reviewing the noise mitigation section, we find several instances where DEC "*encourages*" industry to mitigate noise and even provides "*guidance*", but again, no meaningful requirements [dSGEIS p. 7- 109].

2. While we appreciate the consideration given to noise mitigation during the creation of the well site case [dSGEIS p. 7- 109], we find little attention given to the ongoing operation of these sites. Compressors and separator noise represent the ongoing impact of a gas field operation and requires equal if not more vigilance, especially when it holds the possibility of operating during the evening hours and over the weekends, or near critical (or sensitive) natural areas.

Chemical Issues

1. Inadequate data on chemicals - Data exists for 197 chemicals with complete information on 152. Within the 197 products are 260 chemicals that the DEC identified and at least 40 that they have not. (dSGEIS p. 5-35) DEC has not considered or investigated the biocides being used; at least one of which (4-nitroquinoline-N-oxide) is used to induce cancer in laboratory rats. [dSGEIS p. 5-111, 6-92, testimony of Dr. Hays] Appendix 11, p. 32 states that "*The solubility of many chemicals proposed for use in hydraulic fracturing in New York State are not well established or are not available in standard databases…*"

2. There is no permitting proposed for the 10,000 to 12,000 gallons of diesel fuel that will be stored on site. That is the quantity of gas that an ordinary gas station keeps on hand [dSGEIS p. 5-23].

3. The dSGEIS proposes to wait for an emergency to research some of the chemicals "*In the event of environmental contamination involving chemicals lacking readily available health effects information, the toxicology literature would have to be researched for chemical specific toxicity data*" [dSGEIS p. 5-65].

4. Radioactive contamination of drilling equipment and waste is completely unexplored [dSGEIS p. 5-131]. "*No state has assessed the occurrence of NORM from longer duration drilling operations at multi-well sites or larger accumulations of shale cuttings from horizontal drilling*" [dSGEIS p. 7-99]. However, initial tests show potential for NORM build up to the extent that NORM waste may require licensing, and production water may be subject to limitations as radioactive waste [dSGEIS p. 7-103].

5. Synergy, whereby chemicals react with each other and the environment has not been investigated. There may be many chemicals produced by the reaction of fracking fluids with each other and the environment that result in the production of chemicals that escape testing. Benzene is a known carcinogen.

6. Refusal to consider "*green chemicals*" on the basis that "*at this time, it may not be feasible to require the use of 'green' chemicals because presently there is no metric or chemicals approvals process in place in the US.*" [dSGEIS p. 9-10] ill serving. The DEC could award merit to those companies that pilot such initiatives.

7. The dSGEIS concludes, "*the only potential exposure pathway to fracturing additives identified by this Supplement is via air emissions from uncovered surface impoundments used to contain flowback water*". Therefore, the DEC proposes that full chemical disclosure be required for applications that propose open surface impoundments. Products listed in Table 5.3 require no additional disclosure, but the application materials will have to specify their planned concentrations in the fracturing fluid. The DEC recognizes that flowback water chemistry may be preferable for determining impoundment emissions, but to date DEC staff has not seen any flowback water analyses that tested for all of the chemicals and compounds that could be present. For well permit applications that do not propose use of open surface impoundments, the DEC proposes to require identification of additive products and proposed percent by weight of water, proppants and each additive. This Supplement has not identified any potential impact other than impoundment emissions that requires full compositional disclosure to the DEC for such water-based solutions. This mindset ignores the possibility of spills that may lead to soil and ground water contamination, vapor intrusion or dermal contact by people. (See item 8 below.)

8. The assessment of exposure risk to fracturing chemicals [dSGEIS p. 5-62] considers potential exposures only via water or ambient (outdoor) air. Soil contamination could also create exposure pathways via physical contact, food ingestion or even vapor intrusion. These exposure pathways need to be addressed and mitigated in the dSGEIS.

9. The conclusion is made [dSGEIS, p.5-66] that there are no potential exposure conditions that are <u>qualitatively</u> different from those addressed in the baseline GEIS. However, the new slick water fracturing techniques, with vast amounts of water and chemical additives, constitute a major new source of potential contamination, and therefore constitute <u>quantitatively</u> a greater risk to communities and natural resources. This is effectively an apples-to-oranges comparison.

10. Are drillers capable of assessing the relative chemical compositions of flowback fluid and able to determine their applicability for re-use at another well [dSGEIS, section 5.12.2]?

11. Injection wells should only be considered for storage of naturally occurring materials (brines and shales) [dSGEIS, section 5.13.3.1] and must be placed substantially deeper than the local aquifers.

Geological Concerns

1. Since there is an 8% probability of 'significant' seismic activity every 50 years [section 4.4], and the proximity of the Marcellus shale to local aquifers (roughly 100-200 feet), and a possibility of seismic activity associated with fracturing actions, attention must be paid to accurately map aquifers, the location of the Marcellus shale, and local fault lines to ensure that drilling occurs in low risk regions.

2. Since radioactive material is documented to be associated with the Marcellus shale [section 4.6], it is prudent to establish strict rules for handling waste shale materials.

3. It is suggested that there is little risk to workers from the NORMs associated with the Marcellus shale [section 5.2.4.2] since the quantity of material extracted from a single well bore is low. However, it is not unreasonable to recommend that there be an abatement plan for long-term exposure to workers or at sites where waste material is stockpiled.

4. Lack of understanding about results of underground fracturing "*ICF reports that, despite ongoing laboratory and field experimentation, the mechanisms that limit vertical fracture growth are not completely understood*" [dSGEIS p. 5-89]. This indicates that analytical techniques are still imperfect and that assumptions are just that. [dSGEIS p. 5-90].

5. The document lacks discussion of and mitigation measures for drilling into faults or inducing seismic reactions, because it is "*in the operator's best interest*" to avoid drilling into a fault and they will "*endeavor*" to be "*prudent*" [dSGEIS p. 6-149, 150, 154]. A policy must be devised that eliminates this ambiguity.

6. The document lacks discussion of and mitigation measures for when drilling and fracking intersect with natural faults. These fissures result from the sheering and uplifting of the geologic layers. They exist throughout the continent, but especially within the older mountain ranges of the Appalachian chain. Long since dissipated from the area immediately surrounding the intersections with the deposit, the very process that facilitates migration of gas towards well bores (fracking), facilitates migration of gas towards the natural fractures as well. Additionally, the fracking process is not as controlled as the industry would have people believe. As pressure and chemicals are applied, the fracturing does not disperse evenly, but in fact, follows along lines of least resistance, seeking out the natural fractures. We are focusing all our attention on securing the front door while the back door is wide open.

Wildlife Impacts

1. Wildlife are expected to know that the five-acre open pits of toxic waste are just that and not ponds [dSGEIS p. 6-48]. It is suggested but not required, that operators make pits "*unattractive*" to wildlife and netting "*should be used*" [dSGEIS p. 7-83]. This must be a requirement rather than a suggestion.

2. The dSGEIS lacks discussion about measurement or mitigation of impacts to wildlife and habitat fragmentation resulting from well sites (active or reclaimed), access roads, compressor stations, and pipelines [dSGEIS, section 6.4]. Remaining infrastructure at well sites and land limitations along pipelines can adversely impact restoration of appropriate ecosystems and habitat.

3. A comprehensive plan for dealing with invasive species *will be,* but is not yet developed [dSGEIS p. 7-74]. The DEC notes, "*precautions must be implemented*" but does not provide any [dSGEIS p. 7-78]. In addition, after noting, "*the safest way to avoid transfer of invasive species is not to transfer water from one water body to another*" [dSGEIS 7-78], yet DEC will not prohibit the practice.

4. Visual impact mitigations are not mandated, but the DEC suggests the industry voluntarily take or not [dSGEIS p. 7-104] and DEC "*encourages*" the operators to review the local land use plan and to try to not site wells in areas where there will be impacts. Nevertheless, none of this is mandatory [dSGEIS p 7-106].

5. The DEC notes that "*noise is best mitigated by distance*" and that drilling is more tolerable during the day than at night [dSGEIS p. 7-107], but does not mandate noise buffers or restrictions on drilling times.

6. There is no discussion of noise impacts on local wildlife, and no mitigations proposed to address these adverse impacts.

7. There is no assessment of drill site impacts upon migrating bats or birds. The height of drilling rigs, nighttime lighting and support wires all have potential impact on these species if located in migratory pathways during the migratory seasons.

Municipal Concerns

The numbered items below provide specific commentary based on content of the SGEIS that implies municipal responsibility for the following:

1. Responsibility for monitoring baseline and ongoing water tests [dSGEIS 7-42].
2. Responsibility for monitoring and investigating water contamination [dSGEIS p. 7-42].
3. Responsibility for storm water permit inspections [dSGEIS p. 7-25].
4. Suggests drilling companies "*consider*" impacts of flooding [dSGEIS p.6-42] and local land use regulations, but neither are mandated.
5. Responsibility for testing road system integrity [dSGEIS p. 7-110].
6. Suggests drilling companies commit to road use agreements (to repair roads, avoid peak hours, provide off street parking, etc.) but are not mandated [dSGEIS p. 7-110].
7. Responsibility to monitor the NYSDEC website to learn about wells [dSGEIS p. 7-110]. DEC should be proactive in communicating with landowners and municipalities regarding individual wells within their property or borders.

If these actions by municipalities are indeed mandated, then a funding source needs to be provided for the municipalities for staffing, training, equipment and supplies. Revenues should come from fees or taxes collected from the gas industry.

Enforcement and Monitoring Issues

1. There exists a lack of required inspections on the site (pre-drilling and at closure only) when inspection should be required as a deterrent [dSGEIS p. 1-5, 5-127].

2. The dSGEIS proposes to rely on site-specific permit conditions and other "*existing Department tools*" instead of regulations and rules [dSGEIS p. 3-4, 7-26, and 7-53]. The DEC notes that if they can make site-specific determinations, they do not need to seek variances.

3. It would be prudent to test well water near the horizontal expanse of the drilling operation and not only near the wellhead [dSGEIS, section 7.1.4.1]. It has been suggested that the fracturing solution contain a marker dye that will aid in the detection of any contamination of water supplies. This must be pursued, but not used in lieu of testing for specific hazardous substances.

4. Regarding resource monitoring, the SGEIS introduces water quality testing, conducting benchmark testing before drilling and again during active drilling. Since the dSGEIS states that two-thirds of the hazardous fracturing solution is not recovered, the BCEMC believes that it is prudent to continue monitoring for years afterwards.

5. Further, there must be air and soil testing near operations associated with gas drilling extraction, production, storage and delivery equipment used in these operations.

6. A biological assessment is needed to determine the relative health and populations of flora and fauna near gas exploration, production and delivery operations, before initiating the activities, as well as during, and after final remediation. We are confident that DEC recognizes that it is far more proactive to manage wildlife while populations and ecosystems are still healthy and common, rather than wait to address unexpected declines later.

7. Despite recent economic benefits projections of expected gas development, the DEC maintains that it has adequate resources to monitor and enforce activity in the Marcellus 'play', yet provides no documented analysis or proof to substantiate this assertion.

8. Despite mandating that the local Departments of Health handle water testing, the DEC knows that not every county has their own Health Department. Water testing oversight might better be handled on a regional level with the NYS Health Department. If regulatory responsibilities are delegated to other agencies, there must be a sustainable funding mechanism for staff, training, equipment, inspections and analyses costs. Higher permit fees could generate funds to fulfill this requirement, and perhaps more if NYS imposes an impact fees on the gas industry and adopts a natural gas severance tax. Alternatively, phased permitting must be considered [dSGEIS, section 9.2] if DEC cannot validate its ability or oversee this gas play.

Environmental Justice Issues

The dSGEIS documents DEC's belief that there are no environmental justice issues associated with horizontal drilling and hydraulic fracturing. The dSGEIS states, "*Permitting procedures will apply statewide and provide equal protection to all communities and persons*". Some aspects of the dSGEIS suggest otherwise. For example,

1. Site setbacks vary based on the water resource under consideration. Private wells are given the least protection (shortest setbacks), followed by municipal water supplies, and the NYC watershed gleams the greatest protections in terms of drilling setbacks. Citizens living in rural upstate NY do not see this as equal protection of them or their water supplies. Our water supplies are of no less value to us as New York City's water is to them. We view the attempt to provide special consideration for protecting New York City's water supply as discriminatory.

2. An individual landowner cannot legally create a landfill on their own property, yet the well permitting process allows for burial of waste materials and products on site by the gas drillers. Restrictions on an owners land use should apply equally to those leasing that property.

3. Drill site setbacks are based on recommended distances from residences or public facilities, and/or on perceived safe distances to protect water supplies. Yet the dSGEIS documents substantial information regarding air quality and noise near drilling operations, and the possibility of radiation exposure, which indicate substantially greater setbacks are in order. It is not clearly documented what will be the greatest setback used?

4. An article VII application for a pipeline does not require the applicant to notify private landowners whose land is proposed for use of the pending action [dSGEIS, p. 5-141]. This seems to violate the concept of environmental justice.

5. An "*Amended Certification Process*", in which DEC may participate [dSGEIS p. 5-143], is a sneaky way to conduct a clandestine land grab without the knowledge of landowners or municipal government. We believe the DEC has a moral responsibility, if not a legal one, to uphold environmental justice for all citizens.

RECOMMENDATIONS

Required actions are documented that are both planning and regulatory in nature that best address gas drilling and gas delivery regional impacts. These are organized into the following categories associated with the gas drilling and delivery life cycle:

- General Requirements
- Planning and Application Phase
- Well Site Development Phase
- Drilling Phase
- Production Phase
- Reclamation Phase
- Post-Reclamation Phase

General Requirements

Before permitting any high volume slick-water horizontal drilling, it is imperative that potential long-term issues be addressed.

An assessment of all technologies and processes associated with the gas well development and the delivery infrastructure must be reviewed and mitigation policies developed to mitigate any potential failures that could have adverse environmental impacts. This analysis must include a failure modes analysis that quantifies probability of failure in a reasonable and conservative manner.

The potential for future aquifer contamination by fracturing solution chemicals must be evaluated. This is prudent based upon the data and analysis presented in the dSGEIS; at best two-thirds of the fracturing solution is never recovered. There is no quantitative assessment presented that precludes the possibility of future aquifer contamination by the residual chemicals. The potential impact of future seismic activity (8% probability of '*significant'* seismic activity every 50 years) or the possible failure of well capping technology in the long-term, on the connectivity between the aquifer and the Marcellus shale must not be ignored. Therefore, abatement measures that mitigate any future or long-term contamination must be developed. 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.

There must be required certification and proof that vertical casing design will withstand pressures greater than those documented for any gas drilling activities. The steel and cement used in these casings must meet minimum strength standards and be capable of maintaining integrity for at least 100 years. There must be a

method developed that can accurately assess the integrity of well-capping casings or plugs in the long term, and a mitigation technique defined that addresses any failures of these in the future.

A full build-out analysis must be conducted that includes combined impact from all forms of gas drilling and transportation:

1. An assessment of the full impact of multiple drill sites, access roads, feeder and transportation pipelines and compressor/pumping stations within a community is necessary to determining the full environmental impact of this large-scale industrial enterprise.
2. The cumulative impact of increased truck traffic, drilling equipment operation, well venting and burn-off, and pipeline compressor station operations on local air quality must be assessed and mitigated.
3. The impact of light and noise pollution due to increased truck traffic, drilling equipment operation at multiple well sites, well venting and burn-off, and pipeline compressor station operations must be assessed and mitigated.
4. The impact of multiple drilling operations on local soil and water quality due to water withdrawals and waste disposal must be assessed and mitigated.
5. The cumulative impact of multiple access roads, drill sites and pipelines on the quality of local habitats and ecosystems, and the ensuing impact to flora and fauna must be assessed and mitigated. A regional plan for minimizing the spread of invasive species and minimizing ecosystems fragmentation must be developed.
6. The cumulative impact of multiple access roads, drill sites and pipelines upon local agriculture must be assessed and mitigated.

It should be noted that this is not necessarily as difficult as it initially appears. Many of these impacts are 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 the individual setback requirements and the 'best practices' that must be required of the industry, will go far to mitigate these broader-based and long-term concerns. Further, extended horizontal 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 footprint of drilling within a locality, and thereby help reduce the cumulative impact.

There is no comprehensive assessment of the impact of horizontal gas drilling on wildlife and their habitats, for either individual well sites or the cumulative impact of several sites and the delivery infrastructure. There must be an assessment of these larger scale impacts, and a reasonable mitigation plan must be developed and implemented. At a minimum, the site selection process for individual wells must be established with the goal of minimizing the impact of the delivery pipeline on local habitats, including the impact of habitat fragmentation.

To reduce the chance for invasive species introduction, foreign soils or fills must not be permitted onto a drill site. Unused freshwater disposal into other bodies of water poses another opportunity for transfer of invasive species and is therefore discouraged. Similarly, soils and fills should not be transported from a site to other locations.

There is no quantitative standard established for noise pollution associated with either the drilling operation or the delivery infrastructure. A mitigation plan for noise abatement must address noise of the drilling operation, noise associated with water extraction activities, noise of the increased local trucking, and noise associated with the future delivery infrastructure. The impacts of noise must be understood for both the quality of human life and for local wildlife. The mitigations should include hours of operation and setback requirements for both residences and wildlife for all phases of gas resource development and delivery.

There is no assessment of the cumulative impact of the truck traffic associated with the horizontal drilling activity on local air quality. There must be a study to understand the full impact of truck traffic, not only due to diesel exhaust, but also to the increased levels of road dust launched into the air. This will have a significant impact on air quality for those living along the roadways where traffic traverses. This must be understood and a mitigation plan developed and implemented.

Air quality dispersion analyses for all drilling-related airborne pollutants must consider a full range of topographical situations, meteorological conditions and the number of operating drill sites, compressor stations and potential leakage from pipeline connectors within a community.

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

The DEC should conduct a Regulatory Impact Assessment to address staffing and oversight matters and include this assessment as part of the dSGEIS. The BCEMC expresses significant concern over the number of DEC inspectors available for the frequency and level of oversight and the quality and types of training they are receiving. Effective training of DEC personnel *must* also encompass the evolving and different varieties of new 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. Recommendations for effective policing are the following:

1. Since the extent of drilling proposed in New York will likely over-extend the manpower resources currently employed by NYSDEC, delegation of authority to county or municipal entities, with appropriate training, might be considered for providing regulatory oversight of drilling and pipeline operations.
2. This authority could also be granted to private environmental firms, again with appropriate training.
3. Funding to employ additional regulatory personnel could be accomplished through well permit and registration fees, a natural resource depletion tax, increased fees for violations or other similar mechanisms.
4. Adequate bonding for the reclamation or closure of drill sites should be required. This could serve as a deterrent to less-than-environmentally friendly practices.
5. DEC should increase fines for penalties and use the funds to establish corrective action funds as in the state's hazardous waste site remediation programs.
6. The DEC should establish an industry-specific (drilling) complaint hotline for each DEC region.

Standards for defining unacceptable and unsafe concentrations for the pollutants associated with gas drilling and gas delivery must be developed, and should be based on science, without any political leveraging. Total pollutant concentration levels from multiple pollutants should be no more than the minimum acceptable concentration of 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 actions have the potential to impact communities for years to come. As part of the dSGEIS, 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.

Planning and Application Phase

During the planning and application phase, there must be a review of land use (including residential demographics), local water resources, local agricultural resources, local habitats and wildlife resources. Rules must be established that provide the lowest risk of negative impacts to all of these resources.

A process whereby collaboration between all the DEC's divisions (Mineral and Gas Resources, Water Resources, Air Quality, and Wildlife), the gas industry, local municipalities (including their Conservation Advisory Committees, if applicable), and landowners is assured. This collaboration would assess all impacts associated with the proposed site of a well pad and future gas delivery pathways, and establish a plan that minimizes local impacts. This process would help mitigate impacts on existing land uses, and help to maintain the rural, natural status of open spaces to the maximum extent possible.

Based on potential issues associated with noise impacts on nearby residents or wildlife, a scheduling of drilling activities may be required. This must include restrictions on the daily hours of operation and specific seasonal dates of operation to mitigate these impacts. Also, scheduling must be considered for hours of usage of local roadways to mitigate road noise in residential areas by the truck traffic associated with drilling.

Based on the number of wells proposed for a site (multi-well pad), and the horizontal extent of these, a plan for benchmark testing of local water supplies must be established that considers all the water supply resources that overlay the total expanse of horizontal drilling, and not just within some radius of the well pad.

Similar to the benchmark testing of local water supplies, there must also be benchmark test plans developed for soil and air resources. Benchmark soil testing would be used to determine the quality of drill site clean-up activities and the future site reclamation activity. Acceptable soil contamination standards must be established to help define the scope of clean-up efforts. The benchmark air quality testing would be used to as a basis for comparison of air quality testing during drilling operations, in the vicinity of delivery equipment operations and along the principle roadways used by the trucking that supports the gas drilling operations. This would also serve as a basis for refining air dispersion simulation models to help improve the accuracy of their predictions in the future.

The DEC, along with NYSDOH, should coordinate by permit the baseline testing of the local soil, water and air (at the expense of the drilling company and only by state certified contractors) to establish background levels for all pollutants that are an expected consequence of the drilling operation. This testing must be repeated at critical times during the drilling activity, and again once the drilling is complete and the drill site reclaimed. To accomplish this testing, full disclosure of the chemicals and materials used in the fracturing, drilling and maintenance processes must be disclosed to the DEC, the regional and local Health Departments and to local Emergency Services/Planning Coordinators, among others.

All ground water withdrawals or water withdrawals from local streams or lakes must be coordinated with NYS DEC Division of Wildlife, NYS DEC Division of Water Resources and the appropriate River Basin Commissions. No water for drilling should be taken from local aquifers, which are critical resources for local municipalities, agriculture, and private residential wells. Any water withdrawals from local streams or lakes must be coordinated with current weather conditions (such as drought or flood situations). No streams or lakes should be used as a location for waste disposal from any well site.

A disposal plan for all waste materials associated with the drilling operation must be accepted *before* a drilling permit is issued. Burying or burning of wastes at any location or the dumping any wastes into any bodies of

water, streams, or wetlands must be prohibited. All waste disposal plans must include a methodology to prove compliance by all persons involved.

Require submission of Spill Prevention Response/Countermeasures Plan as a requirement for a permit. Ensure that all drill pads have secondary containment and/or ensure that all tanks and mixing areas where fracturing fluids will be combined have secondary containment in place. Bulk storage of mixing agents onsite should require special permit conditions to ensure safety.

The DEC should require by permit condition or through regulation that all gas drilling, fracturing, extraction and delivery operations comply with all state health, agriculture and markets, soil and water, and environmental conservation laws and standards; and meet the equivalent of or exceed all federal standards and regulations (Safe Drinking Water Act, Clean Air Act, Clean Water Act, Resource Conservation and Recovery Act, etc).

The re-use of fracturing waste products, although an increasingly common practice must be required and not just encouraged.

DEC must also require that waste brines be tested for contaminants before authorizing a beneficial use for roadways. Further, an assessment of the salinity of these fluids must be made to ensure that there are no adverse impacts to roadside flora, adjacent water sources, or sensitive areas.

The DEC should require site photographs accompany each permit for pre and post operation documentation.

Well Site Development Phase

Based on the data provided in the dSGEIS, it is apparent that many of the environmental risks of gas drilling are associated with the use of open pits for both flowback water and post-fracturing waste water. Therefore, it is imperative that only closed-loop systems using sealed tanks be used. This is the best method by which the probably of contamination due to spills and evaporation into the air is minimized. The DEC should support NYS Assembly bill A11606 or other regulation calling for use of non-toxic fracturing solutions or otherwise encourage the use of more environmentally friendly products.

For sites where ponds are created for the storage of fresh water to be used in the drilling process, there should be a limitation placed upon the location of these ponds in the context of ground slope and ecology. Ponds should not be permitted where large ponds create an erosion risk due to steep slopes or result in the clear cutting or mature and diverse forests. Similarly, sites must be selected where there is no need for cutting roads along steep slopes, which would also contribute to erosion.

The site selection must comply with setback restrictions that are based upon the greatest setback needed to mitigate noise impacts, water resource protection and air quality management. These setbacks must be applied equally to locations inhabited by the public (residences, schools, places of work, etc.) and to all nearby agricultural and natural areas. Any degradation of these open spaces, even if presently common or not considered ‘sensitive’ will constitute a negative, cumulative impact. As stated previously, maintaining common, healthy ecosystems and habitats today ensures that these do not become threatened or endangered in the future.

Drilling Phase

Inspections *must* be conducted once a site is prepared for drilling, but before commencement of drilling activities, to ensure that all spill containment measures and erosion control measures are aptly in place.

Once drilling commences, any recovered shale must be tested immediately to determine the degree of radioactivity associated with any NORMs in the shale. Based on these test results, the waste materials must be immediately trucked to an appropriate location for either temporary storage or permanent disposal. Any proposed permanent disposal of NORMs or brines at the drill site must require storage at a depth below the depth of the horizontal boring.

Besides the requirement that all trucks removing waste have permits indicating the intended disposal facility, each truck should have a manifest indicating the content and quantity of the waste being trucked. There must be reporting from the receiving waste treatment facility that will document that all the waste leaving a drill site is received by the waste treatment facility. The DEC should allow only haulers with valid NYCRR Part 364 Waste Transport Permits to transport waste fluids for disposal. The DEC should maintain a list of certified reputable haulers as part of their oversight and enforcement of this expanding sector of the industry.

The DEC should require use of electric generators whenever power supplies exist and whenever practical to help mitigate impacts from diesel fumes. In addition, use of clean fuels, such as low-sulfur diesel, must be mandated because of the duration and magnitude of action.

There must be frequent, unannounced site inspections conducted throughout the gas drilling operations and at all sites. If DEC field staffing is not adequate to support this activity, then a funded mandate must be passed onto the municipalities and counties, so that these inspections are conducted by local government entities. Inspection reports would be passed onto the appropriate DEC and DOH personnel.

The DEC should require that measures are taken to measure and minimize visual pollution impacts with fencing, vegetative buffers, or other practical means of screening.

The storage of waste materials and unused equipment on a drill site once the drilling and fracturing operations are complete must be prohibited.

Production Phase

Once a viable gas well has been developed, the ensuing public service reviews for the delivery pipelines and any necessary compressor stations must be straightforward, assuming that there is no deviation from the planning associated with the preliminary planning and application phase (see above).

The DEC should require that pumping/compressor stations use fuel-efficient and low-noise engines and compressor designs, and require building wraps to further mitigate noise impacts. If possible, it would be beneficial to use a portion of the recovered natural gas as a clean, local fuel source for powering any compressors required in the delivery infrastructure.

Again, and similar to the drilling phase, the DEC must require that measures are taken to measure and minimize visual pollution impacts of the delivery infrastructure with fencing, vegetative buffers, or other practical means of screening.

Recommended standards for transmission infrastructure (size and location of pumping/compressor stations, issues of eminent domain for transmission lines, density, impacts upon ecosystems/habitats, etc.) include the following:

1. Pumping/compressor stations should be cited where they do not lower residential quality of life or adversely impact sensitive wildlife.

2. Although the PSC has jurisdiction over feeder and transmission lines, the DEC should keep in mind full build out possibilities and permit wells that best use existing utility corridors to the maximum extent possible. Perhaps site specific EISs should be required to determine the overall environmental impact of the full build out scenario.
3. Feeder and transmission lines must be sited and designed to minimize fragmentation of local ecosystems.

Reclamation Phase

Reclamation plans should be developed and approved prior to allowing any drilling. These plans must include ecosystem recovery and address habitat improvements or enhancements, as appropriate for the site under consideration.

No on-site waste storage, at ground level or buried, should be allowed.

The reclamation plan must include habitat restoration plans, and include a management plan for controlling the introduction of invasive species. Ideally, the habitat restoration plan will ensure that the previous flora and fauna are re-introduced, and the plan is not compromised by any requirements of the proposed pipeline development.

The reclamation must not be considered complete until all air, soil and water testing has been conducted and with acceptable findings.

Post-Reclamation Phase

Once all the gas resource is effectively recovered, the transmission infrastructure will require reclamation in the same manner as the individual well sites. Like the wells sites, reclamation plans should be developed and approved prior to any pipeline or compressor station development. These plans must also include ecosystem recovery and address habitat improvements or enhancements, as appropriate for the location under consideration.

There must be a long-term monitoring plan to continue to ensure that there is no contamination brought about by any vestiges of the gas resource development. As stated before, there should be continued water quality monitoring and testing conducted to verify the integrity in the long term of any plugging or capping of abandoned well sites.

Closing

We hope that you find the review comments regarding the dSGEIS and the recommendations provided herein to be constructive and useful input for finalizing the dSGEIS's content and preparation of the Responsiveness Summary. We are sure that you recognize that the development of the Marcellus Shale gas resource, and other similar low-permeability shale resources, can provide enormous opportunity for New York, but with real risks to our other natural resources, natural beauty and to New York's citizens' overall. It is our hope that the final findings and regulations for this new industrial activity will provide adequate protections for all, and ensure that best practices are NOT relegated to the negotiated lease contracts of local coalitions. All of New York's citizens - whether landowners that stand to gain, or citizens with no economic interests from this development, and our future populations - deserve equally the best stewardship of our natural resources that we can provide.

We look forward to reviewing the Responsiveness Summary and final SGEIS. We 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 human quality of life in New York.

Yours Sincerely,

André LaClair
(Electronically signed)

André G. LaClair
EMC Chairman

AGL & SM

cc: D. Paterson, NYS Governor
P. Grannis, NYSDEC Commissioner
S. Gruskin, NYSDEC Executive Deputy Commissioner
A. Crocker, Deputy Commissioner and General Counsel, NYSDEC Office of General Counsel
J. McKeon, Deputy Commissioner, NYSDEC Office of Administration
M. Lenane, Deputy Commissioner, NYSDEC Office of Regional Affairs and Permitting
V. Washington, Deputy Commissioner, NYSDEC Office of Remediation and Materials Management
H. Hamilton, Asst Commissioner, NYSDEC Office of Public Protection
J. Snyder, Asst. Commissioner, NYSDEC Air Resources, Climate Change and Energy
J. Tierney, Asst. Commissioner, NYSDEC Office of Water Resources
C. Amato, Asst. Commissioner, NYSDEC Office of Natural Resources
J. Schreiber, NYS Attorney General Office, Environmental Bureau
D. Lupardo, NYS Assembly
C. Crouch, NYS Assembly
G. Finch, NYS Assembly
R. Gottfried, Chair, NYS Assembly Health Committee
R. Sweeney, Chair, NYS Assembly Environmental Conservation Committee
K. Cahill, NYS Assembly Energy Committee
T. Libous, NYS Senate
A. Thompson, NYS Senate Environmental Conservation Committee
T. Duane, Chair, NYS Senate Health Committee
D. Aubertine, NYS Senate Energy & Telecom Committee
K. Gillibrand, US Senate NY
C. Schumer, US Senate NY
M. Hinchey, US Rep. NY
M. Arcuri, US Rep. NY
J. Enck, EPA Region 2 Administrator
W. Mugdan, EPA Region 2 Divisions of Environmental Planning and Protection
B. Fiala, Broome County Executive
P. Brennan, BC Deputy Executive
D. Fauci, BC Deputy Executive
J. Sluzar, BC Attorney
E. Denk, BC Legislative Clerk
D. Reynolds, BC Legislative Chair
BC Legislature
F. Evangelisti, Acting Commissioner, BC Planning
Acting Director, BC Division of Environmental Health
W. Heaviside, NRC Chair, BCEMC
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