



December 12, 2008

**DEPARTMENT OF  
ENVIRONMENTAL  
PROTECTION**

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Attn: Scope Comments  
Bureau of Oil & Gas Regulation  
NYSDEC, Division of Mineral Resources  
625 Broadway, 3<sup>rd</sup> Floor  
Albany, NY 12233-6500

Re: Draft Scope for Draft Supplemental Generic Environmental Impact Statement (dSGEIS) on the Oil, Gas and Solution Mining Regulatory Program (dated 10/6/08)

To Whom It May Concern:

The City of New York submits the following comments on the draft scope for the Draft Supplemental Generic Environmental Impact Statement (dSGEIS) on the Oil, Gas and Solution Mining Regulatory Program – Well Permit Issuance for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas Reservoirs.

The New York City (NYC) water supply provides high quality drinking water to nearly half the population of the State of New York – over eight million people in New York City and one million people in upstate counties. The New York City Department of Environmental Protection (DEP) is the City agency with primary responsibility for overseeing the operation, maintenance and management of the water supply infrastructure and the protection of the 1,969 square mile watershed. The Marcellus Shale underlies the entire West-of-Hudson portion of the New York City water supply which typically supplies 90% of the City's drinking water, a source of such high quality that the water does not require filtration. One specific concern of DEP is the potential consequences this activity could have on our watershed protection program and our ability to maintain filtration avoidance.

Natural gas drilling has the potential for both acute and chronic potential impacts to the water supply infrastructure, water quality and water quantity from natural gas extraction. In the West-of-Hudson area alone, DEP operates and maintains over 167 miles of tunnels and aqueducts and 45 shafts both within and outside of the watershed's boundaries. These tunnels, aqueducts and shafts often operate under high pressure and inadvertent penetration could significantly impact the City's ability to provide sufficient supplies of high quality drinking water to millions of consumers.

DEP is also very concerned about the chemicals used in hydraulic fracturing which have the potential to cause significant harm to the watershed and the water supply. We recognize that New York State has a regulatory program for oil and gas activities and that procedures are already in place which seek to prevent surface or groundwater contamination. However, as DEC recognizes, when this program was put into place, no specialized review of the potential impact of these activities on this activity in NYC's unique watershed was undertaken. In addition, even a well-designed permitting program cannot prevent unanticipated releases which may result in environmental and public health impacts. As such, the risks associated with these activities in an unfiltered water supply, with particular focus on fracking chemicals, must be closely examined in the dSGEIS.

The scope indicates that approximately 99% of the estimated 2 million gallons needed to develop a well is pure water. However, that equates to approximately 20,000 gallons of unknown chemicals *per well site*. Some of these chemicals are toxic even at very low concentrations. For example, one of the common chemicals associated with contamination from natural gas drilling, benzene, has an ambient groundwater standard of 1 ug/l – or one part per billion (6 NYCRR 703.6). Before allowing such large quantities of chemicals to be stored and pumped into the ground, it is critical that these chemicals be fully identified and their potential impacts be assessed in the environmental review.

Finally, the dSGEIS must thoroughly evaluate the potential cumulative impacts from all aspects of natural gas exploration and drilling. This evaluation should use conservative assumptions and look at the magnitude and extent of natural gas development, the subsequent abandonment and restoration of sites, the total amounts of chemicals released over time (intentionally and accidentally), and the total land disturbance not only from well pads but the network of gas collection pipelines, access roads and compressor stations. The assumptions and methodologies utilized for cumulative impacts must be clearly identified in the final scope for the dSGEIS.

Attached are specific comments on the scope for the dSGEIS for your consideration. If you have any questions or would like to discuss these comments further, please do not hesitate to contact me. It is important that our two agencies coordinate closely to protect such a vital resource.

Sincerely,



Steven W. Lawitts

Enc.

cc: Commissioner Grannis  
Executive Deputy Commissioner Gruskin  
Assistant Commissioner Tierney  
Deputy Commissioner Cauty  
Deputy Commissioner Rush

## Specific Comments on the Draft Scope for the SGEIS

### Section 1.0 Introduction

- 1.1 In addition to the Marcellus and Utica Shales, the dSGEIS should acknowledge the existence of additional shale plays in New York State that have may have natural gas development potential.
- 1.2 The Introduction should indicate that the DEC is charged with regulating the Development of oil and natural gas wells (in addition to their plugging, drilling & operation).
- 1.4 The GEIS language referenced in this portion of the draft scope of the dSGEIS should specifically reference Water Supply Reservoirs in addition to supply wells, Parkland, Agricultural Districts, etc.
- 1.4 The GEIS considered issuance of an oil and gas drilling permit above an aquifer as a non-significant action. The dSGEIS should re-evaluate this in the case of high-volume hydraulic fracturing and horizontal drilling.
- 1.5 Long-term development of the Marcellus Shale will involve construction of a large network of gas collection pipelines and compressor stations. Construction of this network may have cumulative impacts (e.g. land disturbance, disturbance of buried infrastructure) that are not adequately addressed through case-by-case pipeline construction permits. While it is understood that pipeline regulation is excluded from the draft scope, the cumulative impacts of pipeline network construction and other ancillary gas development activities should be considered among the impacts addressed in the dSGEIS.

### Section 2.0 Description of Proposed Action

- 2.0 The dSGEIS should be more clearly focused on evaluating the long-term cumulative impacts of the proposed action. The dSGEIS should also consider critically the relevance of assumptions and methods used in development of the 1992 GEIS.
- 2.1.1 More information needs to be provided on how the environmental and structural impacts associated with horizontal drilling will be examined and reviewed. This analysis should include a review of case studies outside of New York State where this type of drilling has been used in similar shale formations.
- 2.1.1 The draft scope states that “*horizontal drilling is performed using the same equipment and technology as vertical drilling, with the same protocols in place for aquifer protection, fluid containment and waste handling.*” This statement is not entirely accurate, since the horizontal drilling proposed for the region, including NYC watershed lands, would inherently use different techniques and could use different chemicals than those used in vertical drilling. The dSGEIS should include a robust evaluation of actual current and expected horizontal drilling practices and should establish protocols for aquifer protection, fluid containment and wastes handling that are based on these practices, not on past vertical drilling experience.
- 2.1.1 Drilling associated with the Marcellus and other geologic formations deposited in “anoxic” environments (e.g., Utica shale) will produce cuttings and waste fluids that

contain radiological contaminants (such as radon and uranium), low pH (acidic) water and dissolved metals (e.g., iron), and dissolved “salts”. The dSGEIS should evaluate requirements for testing, treatment, handling and disposal procedures for drill cuttings in order to protect the quality of water in the respective watersheds (as well as the health of those who live in proximity to the potential drill sites).

- 2.1.2 The draft scope states that *“The Department has no record of any documented instance of groundwater contamination caused by hydraulic fracturing for gas well development in New York, despite the use of this technology in thousands of wells across the state during the past 50 or more years. Division of Mineral Resources staff responsible for permitting and oversight of gas well drilling since 1980 also do not recall any such instance.”* Though this experience is encouraging, the dSGEIS should not be guided by DEC’s experience alone, and should consider the numerous reported instances of improper waste handling and subsequent surface water and groundwater contamination that have occurred in other states with extensive natural gas development. Specifically, the dSGEIS should identify the lapses in regulations, monitoring, or enforcement that allowed these contaminations to occur, and should detail how the dSGEIS will prevent similar occurrences in New York.

It is important to also look at this technique and instances of groundwater contamination in other states. According to a November 11, 2008 article in Business Week entitled “Does Natural-Gas Drilling Endanger Water Supplies?” for example, there have been cases of groundwater contamination. The article states:

*“Serious episodes of water contamination near drilling sites have been documented in seven states: Alabama, Colorado, Montana, New Mexico, Ohio, Texas, and Wyoming, according to public records and interviews with state and federal officials. Numerous incidents of contamination have occurred in western Colorado, where drilling has expanded swiftly. In 2004 a well casing shattered beneath a rig at Divide Creek, a tributary of the Colorado River, which supplies water to seven states. Dangerous levels of benzene turned up in groundwater and stream samples, state records show. Benzene is a carcinogen, according to the EPA, and has been linked to aplastic anemia and leukemia.”*

- 2.1.2 The Draft scope states that the dSGEIS will review *“information about fracturing fluid additives collected from service companies and chemical suppliers.”* This language is imprecise and insufficiently protective of water quality. Given the toxic character of many of the additives used in hydrofracturing, the instances of contamination that have occurred in other states, and the potential impact of such contamination on the water supply for nine million people, the dSGEIS should require complete and transparent identification of all chemicals used in the well development process, as well as the amount of each chemical that is expected to be used and recovered from each well.
- 2.1.2 The dSGEIS should also address casing “perforating” and related yield stimulation practices which involve the use of explosive compounds and processes. Specific disclosure of the explosives and amounts to be employed for this stage of well development should be required. The DEC should also develop guidelines for the handling, transport and disposition of any explosives to be used in well perforating.

- 2.1.2.1 Water and chemical handling at the well sites needs to be thoroughly examined. How many trucks will be required to deliver the water and chemicals per well sites? How long is the average drilling process? How much land disturbance is required for storage tanks or pits per well? How frequently will these sites be inspected and specifically how will DEC field inspectors monitor proper liner performance for lined pits? How will the information collected during these inspections be shared with localities and water suppliers?
- 2.1.2.1 The commitment to examine the need for pit liner specifications is appropriate. Specification of liner or tank materials may be warranted to ensure materials are compatible with all chemicals used in the process. The dSGEIS should require that all liner or tank materials are compatible with all the materials that they will contain, regardless of concentration. Given the huge volume of water used, reuse of injected fluids should be encouraged.
- 2.1.2.1 The 1992 GEIS references open pit sizing based on drilling operations that use approximately 80,000 gallons per well. The hydraulic fracturing process can use millions of gallons of water per well. The dSGEIS should examine whether the current open pit specifications are applicable or whether new specifications need to be developed to handle the higher volumes of development and fracturing fluids.
- 2.1.2.1 The dSGEIS should ensure that applicable stormwater management requirements are sufficient to ensure that open pits containing contaminated water will not overflow during severe storm events.
- 2.1.2.1 The dSGEIS should examine whether a requirement for closed-loop delivery systems of hydraulic fracturing fluid is appropriate within the NYC watershed and within proximity to public water supply wells in order to mitigate impacts to drinking water.
- 2.1.2.1 Requirements for control of flowback fluids from high-volume hydraulic fracturing should consider realistic DEC enforcement capability. For example, the GEIS concluded that *“regulations detailing pit liner specifications are unnecessary because adequate maintenance is more critical to halting pollution than the initial specifications. Emphasis instead is on a general performance standard and on proper liner maintenance, which are monitored by Department field inspectors.”* In its establishment of on-site fluid handling practices and erosion and sediment control measures, the dSGEIS should not assume that all sites will be adequately monitored and inspected, and should require practices that are sufficiently protective even at realistic DEC monitoring/staffing levels. This comment applies to all activities covered under Section 2.1.
- 2.1.2.1 The spent drilling fluids must be disposed of safely. The dSGEIS should identify the possible out of state industrial treatment plants that can handle the volume and content of the spent fluids, and the impact on these facilities. Additionally, the dSGEIS should identify the New York State sewage treatment facilities that can handle the volume and content of the spent fluids and examine the impact on capacity and treatment of these facilities. The dSGEIS should discuss how New York State regulations govern this activity.
- 2.1.2.1 The dSGEIS should examine the recovery rates of injected fluids and evaluate the fate and potential environmental impact of the unrecovered fluids.

- 2.1.2.2 Recent exceedences of total dissolved solid limits in surface waters in Pennsylvania have halted disposal of spent fracturing fluid /brine at Pennsylvania wastewater treatment plants from in-state and out-of-state. This underscores the need for a regional evaluation of brine disposal options for states expecting to exploit the Marcellus Shale formation and the river basins that they share, particularly New York, West Virginia and Pennsylvania and Ohio. The dSGEIS should examine regional brine disposal options.
- 2.1.2.2 The technical justification for permitted use of injection wells for the disposal of drilling fluids in a public water supply watershed and areas where private water supplies occur needs to be provided relative to the specific hydrogeologic conditions of the region. Similarly, the effects of “recycling” of fluids through the use of closed loop systems and local sewage treatment facilities needs to be evaluated relative to the chemical composition of the disposed fluids and impacts on the receiving groundwater and surface water resources. The influence of water-supply well pumpage and low-flow surface-water conditions need to also be addressed on these potential disposal options, with the denial of any such activity within the watershed of a water-supply reservoir or well as an acceptable option.
- 2.1.2.2 Both federal law {40 CFR Part 144.6(b)} and state law {6 NYCRR 371.1(e)(2)(v)} exempt oil and gas drilling waste from being considered a hazardous waste, which exempts the waste from the accounting procedures that track the wastes to their ultimate disposal location. The Draft scope states that there is potential for creating millions of gallons of contaminated fluid per well. Additionally, Chapter 9, Section H.8 of the 1992 GEIS states “*Should oil and gas development continue in New York State, more local brine disposal wells and industrial waste treatment plants will be necessary because of high transportation costs to out-of-state disposal facilities.*” Given the high cost and difficulty of disposing of drilling waste, the dSGEIS should examine a program to track the ultimate disposal of the contaminated fluids to prevent illegal dumping of the waste in remote areas and the potential risks to drinking water supplies.
- 2.1.2.3 The draft scope states that DEC has the authority to require operators to provide details on chemicals that are cited as trade secret. The dSGEIS should state that DEC would *require* operators to provide all details on chemicals regardless of trade secret status. Further, the dSGEIS should include provisions that require DEC to share this information with drinking water suppliers that may be affected by a proposed fracturing operation. This information is critical for establishing background conditions for any ambient water quality monitoring program that may be implemented to assess impacts of gas development activities.
- 2.1.3 The dSGEIS should address how well tests are to be conducted with respect to substantiating a lack of hydraulic interference between existing water supply wells, surface-water bodies, and overlying geologic formations. The dSGEIS should also address how the disposition of fluids produced during testing will be dealt with relative to the constituents being used for gas well development.
- 2.1.4 The dSGEIS should discuss the overall amount of land disturbance and particularly the amount of impervious surface that is anticipated for each well.
- 2.1.5 The dSGEIS should reconsider the requirement for bonds to remedy damage caused by drilling including contamination of water supplies (surface or otherwise) to ensure there is sufficient funding in the event damage is sustained.

- 2.1.5 The dSGEIS should examine the extent to which the well plugging and bonding requirements in the GEIS are sufficiently protective when applied to large scale development of the Marcellus Shale.
- 2.1.6 Given the high resource requirements for these high volume hydraulic fracturing wells, the well density specified in the GEIS should be re-examined.
- 2.1.6 The dSGEIS should identify protocols for addressing the cumulative effect of multiple wells on a site-specific basis, particularly with respect to groundwater contamination, surface impacts, supply well yield, and surface water flows.

### Section 3.0 Geology

- 3.0 The estimates for the amount of natural gas in the Shale formations vary widely. How will these estimates be determined in the dSGEIS?
- 3.0 The dSGEIS evaluation of Naturally Occurring Radioactive Materials in cuttings and spent fluids should include a discussion of how other states are handling the wastes from these operations. Besides addressing the potential existence of Naturally Occurring Radioactive Materials (NORM) the draft scope should also address the potential impacts of other mineralogical constituents on the quality of drilling cuttings and fluids, and the possible impacts on local water quality due to runoff generated in the area where these materials are accumulated in the well site vicinity. Any available monitoring data related to this issue should also be compiled and presented in the dSGEIS.
- 3.0 The draft scope should acknowledge the existence of additional potential gas plays beyond the Marcellus Shale that are anticipated to become viable targets for development in the foreseeable future (these may include the Utica and Rochester Shales, Trenton Black River Group, Oriskany Sandstone and others) and that as such these formations may also need to be addressed in a similar fashion. In addition, the role of existing local and regional fracture systems and other geologic “structures” in the Marcellus and overlying bedrock formations should be addressed relative to pre-drilling groundwater flow and contributions to local supply wells, stream baseflow, and wetlands hydrology. The dSGEIS should require that geologic and related hydrogeologic conditions at each proposed well site be addressed on a site-specific basis, since geologic formations are formed under natural and not engineered conditions, thus “one-size does not fit all”.

### Section 4.0 Potential Environmental Impacts

- All Many of the impacts discussed in this section depend on how “temporary” is defined and the duration of specific aspects of the drilling. In particular, a thorough evaluation of the duration of site preparation, drilling and production periods is necessary.
- All The dSGEIS should examine the environmental impacts of drill pad preparation. Will trees be cleared to create drilling pads? Will they be restored? The impact of tree clearings on stormwater management should be evaluated. How will DEC regulate stormwater and erosion control plans at drilling sites?
- All The dSGEIS should thoroughly examine traffic impacts for transport of fluids to and from sites and also the impact of traffic on erosion of roads.
- All For informational purposes the dSGEIS should also include photographs of a variety of well sites outside New York State, to illustrate the appearance of high volume hydro

fracturing wells in shale formations during each stage of operation. Areal views of existing densely drilled areas in other states should also be included to assess cumulative long-term visual impacts in areas that have similarly been developed for natural gas production using high volume hydraulic fracturing in shale formations.

- 4.1.3 The Draft scope states “*concerns regarding evaporation of pit contents do not arise in New York because precipitation exceeds evaporation*”. This may be true on a long-term basis, but substantial seasonal and annual variations may occur, and volatile constituents may evaporate regardless of the amount of precipitation. The dSGEIS should review the applicability of all assumptions made in developing the GEIS.
- 4.2.1 The draft scope addresses the potential for transferring invasive species between water bodies. The dSGEIS should specifically examine the requirement that all unused surface water be returned to its source to prevent spreading invasive species.
- 4.2.1 Withdrawals of millions of gallons of water for hydrofracturing from surface or groundwater in the NYC watershed may have negative impacts on NYC water supply reliability, particularly under drought or infrastructure outage conditions. The dSGEIS should address this issue. When evaluating the potential cumulative impact of numerous water withdrawals on the volume of water available for other needs, including public water supply and in-stream habitat, the dSGEIS should not rely on long-term average withdrawal assumptions and typical hydrologic conditions. The dSGEIS should examine impacts under realistic worst-case hydrologic and withdrawal scenarios. Further, the dSGEIS should require examination of such impacts in a spatially distributed manner that identifies what ground or surface water sources are likely to be accessed, and what the potential water quantity, water quality, thermal, and habitat impacts are at these locations.
- 4.2.2 The dSGEIS should examine case histories in other states where groundwater contamination has occurred from these practices.
- 4.2.3 Federal law exempts produced water from gas production from the Spill Prevention, Control, and Countermeasure Rule of the Safe Drinking Water Act {69 FR 29728}, therefore no spill control plans are required at drilling sites. The dSGEIS should ensure that spill control plans are required for each hydraulic fracturing operation, including provisions for proper equipment and training to address accidental spills on the part of well drilling personnel. The dSGEIS should also ensure through the permitting process that local emergency personnel have sufficient training and equipment to respond to spills.
- 4.2.3 In its evaluation of the potential of Marcellus Shale development to create any surface water impact that is not examined by the GEIS or addressed by existing authorities, requirements and practices, the dSGEIS should consider the DEC’s capacity to enforce applicable regulations. Though regulatory/environmental controls on development activities (including drilling, fracturing, fluid handling, and waste treatment) may in principle be sufficient to prevent impacts, these controls must be enforced to be effective. Thus in establishing specific controls/requirements, the dSGEIS should realistically consider the actual staffing/manpower constraints on DEC’s enforcement program. Environmental controls should be sufficiently robust that water resources are protected even when State monitoring and enforcement capacity is less than ideal.

- 4.2.3 GEIS regulations require that wells be sited at least 50 feet away from any public stream, river or other body of water. The dSGEIS should explain why this distance is acceptable for streams or water bodies in the NYC watershed, and why it is less than the distance of 2000 feet required for a municipal well supply.
- 4.2.3 The dSGEIS should evaluate whether current spill notification requirements are sufficient to allow agencies to implement timely preventive response measures.
- 4.2.3 The dSGEIS should address the potential negative impacts to water quality that may arise as a result of the accidental or intentional introduction of sediment to the surface water bodies that comprise the NYC watershed. Excess sediment may be released to the rivers, streams, reservoirs, etc. through site clearing, drill pad construction, improper handling and disposition of drill cuttings and mud, the discharge of other fluids (such as fresh and saline groundwater), as well as site access and off-road vehicular traffic. A policy on the specific regulations in regard to sediment control in relation to drilling activities and the protection of drinking water (reservoir) quality needs to be outlined as part of the dSGEIS process.
- 4.2.4 DEP acknowledges, and agrees with, DEC's commitment in the scope of the dSGEIS to a focused review of potential impacts on the NYC watershed in light of the fact that this watershed supplies unfiltered drinking water to more than half of the State's population. Some specific considerations based on items in the draft scope are:
- The dSGEIS should identify and examine potential water sources and quantities for high volume hydraulic fracturing, specifically including cumulative impacts, within the NYC watershed.
  - On-site storage of fluids needs to be carefully analyzed. DEP has significant concerns about the use of open pits and disposal wells in the NYC watershed due to the potential risk of contamination.
  - Impacts do not need to be within close proximity to a reservoir or water supply infrastructure to negatively impact the water supply and the entire watershed needs to be included in the assessment.
- 4.2.4 The scope states that the dSGEIS will evaluate impacts in the NYC watershed "*with consideration of the fact that New York City controls a substantial amount of the acreage surrounding the reservoirs through fee ownership or conservation easements so that drilling would not occur on such acreage without the City's permission.*" This misleadingly implies that the City can control natural gas drilling in the watershed through its land ownership or conservation easements. In fact, most land in the watershed is privately owned, and controls are achieved through a combination of regulation, land acquisition, infrastructure investments, and partnership programs with watershed communities. The dSGEIS should evaluate the potential for natural gas drilling to negatively impact the programs, controls, protections and institutional relationships that are required by the Filtration Avoidance Determination (FAD) and embodied in the 1997 Watershed MOA, of which DEC is a signatory. Moreover, State enforcement is an important element of natural gas drilling outside of the watershed, and the same should be true within the City's watershed. The nature of property ownership should not alter the mandate of the State to vigorously protect the State's natural resources, including its water resources.

- 4.2.4 In addition to gas well drilling and hydraulic fracturing, the DEC should consider potential damage that may be imparted to DEP infrastructure via seismic testing and other related exploration and reconnaissance techniques.
- 4.4 In its examination of additional protections or environmental reviews for drilling sites in floodplains, the dSGEIS should ensure that under no circumstances would open pits holding returned fluids be constructed within the 100-yr flood zone. Requirements for siting wells and drilling fluid storage facilities outside of 100-yr flood zones should also be evaluated.
- 4.5 For mitigation of well site impacts to wetlands, the scope simply refers to chapter 8 of the original GEIS. However, knowledge of the importance of wetlands and wetland protection has changed dramatically since the original GEIS. Assessment and mitigation of on site wetland impacts should be addressed in full in the dSGEIS. In particular, the dSGEIS should evaluate erosion and sediment control measures to minimize direct and indirect impacts to wetlands.
- 4.5 The original GEIS allows for the placement of mud and reserve pits within wetlands. The dSGEIS should reevaluate this practice and assess restricting the placement of pits within 100 feet of wetlands to avoid potential disturbance and contamination.
- 4.6 The draft scope states that the dSGEIS will “*address potential mitigation measures to ameliorate the impacts of short-term, high volume truck traffic*”, but that the control is still with the local governments. Further Section 1.2 states that ECL supersedes all local laws “*concerning imposition of a fee on activities regulated under Article 23,*” but also states that jurisdiction over local roads remains with the local government. Given the spatial extent of the Marcellus Shale formation (all or part of approximately 27 counties, including 5 counties encompassing the NYC West-of-Hudson watershed), the dSGEIS should recommend that a comprehensive regional planning approach is taken to address the long-term cumulative impacts of high volumes of truck traffic on transportation infrastructure at state, county, and local levels. Further, regional planning should be recommended to coordinate inter-jurisdictional controls on the transport of equipment, chemicals, water, and fracking fluid.