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Governor David A. Paterson  
State Capitol  
Albany, NY 12224

Sunday, December 20, 2009

Re: Withdraw the draft Supplemental Generic Environmental Impact Statement (dSGEIS) because of inadequate information about the effects of gas drilling of Marcellus Shale on human endocrine and metabolic function.

Dear Governor Paterson:

I have been a resident of Tompkins County since 1990 and I am a registered Democrat who always votes.

I am a physician with a sub-specialty in endocrinology and metabolic medicine. Here is the address of my medical practice:

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I am currently the President of the Medical Staff of the Cayuga Medical Center, the regional medical center situated in Tompkins County in the heart of the Finger Lakes Region of New York State.

I am the owner of an independent medical office and I employ 3 nurse practitioners, 3 registered nurses, 1 office manager, 2 front desk receptionists, one file clerk and 1 office cleaner. They all receive a living wage. My office provides for my workers retirement and healthcare. We provide a needed service to our community and also are proud to generate considerable tax revenues for New York State.

In addition to being a practicing physician and endocrinologist, I have an extensive background in both clinical and basic science research. I received my doctorate at The University of London and have been a post-doctoral fellow at the University of California San Francisco and also at Cornell University. I include my list of publications in the footnotes to demonstrate the range of my scholarship<sup>1</sup>.

I am the only clinical endocrinologist practicing in Tompkins County and I also draw many patients from adjacent counties including: Cortland, Tioga, Chemung, Schuyler, Seneca, and Cayuga Counties. My usual responsibilities involve patient care in my medical office and also in the Cayuga Medical Center. The patients I see in consultation have diabetes mellitus, thyroid disease, problems with their reproductive organs and multiple other less common disorders of hormone producing glands – the pituitary, parathyroids, adrenals, pancreas amongst others.

I want to solely address the lack of information we have about the effects any escaping chemicals may have on the human endocrine system.

I have recently been made aware by my patients of the proposed natural gas drilling in the Finger Lakes Region of the Marcellus Shale. My preliminary reading on the environmental impact of this drilling in the dSGEIS has bought me to the alarming conclusion that my discipline is front and center in public consideration of the human and ecological costs and consequences. To be an effective physician to my community, I need to speak out on this issue to prevent future endocrine disease.

I do not intend these comments to be a detailed discussion of particulars. I wish to show in general terms that the potential for future endocrine disease is a major concern and to emphasize why this needs to be studied in much greater depth. Hence, my considered professional opinion is that the dSGEIS should be withdrawn.

**Endocrine disrupting chemicals and development of gas from shale.** There is a large toxicological literature on chemical agents that disrupt the endocrine system in humans and other species. Enough data has amassed by June 2009 for a comprehensive scientific review by the Endocrine Society entitled “Endocrine-Disrupting Chemicals”<sup>2</sup> to conclude in that “The key to minimizing morbidity is preventing the disorders in the first place”. Furthermore, they add: “In the absence of direct information regarding cause and effect, the precautionary principle is critical to enhancing reproductive and endocrine health”. In short, we should make informed decisions concerning our exposure to these chemicals and be conservative in our use of these agents.

Schlumberger, Halliburton, Exxon and other companies keep us from knowing the exact formulations of their drilling fluids and also the composition of the large volumes of effluent produced water. The dSGEIS does not require disclosure of these chemicals to the public, to emergency responders, nor to physicians. A sampling analysis program of solids from New Mexico natural gas pits sponsored by 19 gas companies listed 24 chemicals that potentially can disrupt the hormone system<sup>3</sup>. Which of these chemicals are being used in the Finger Lakes region to extract the natural gas?

There has been no transparency as to the exact composition of the additives to the hydro-fracturing fluid. In order for us to know the potential for endocrine damage to our population this has to be explicitly addressed in any environmental impact analysis. Furthermore, we have no clear idea of the composition of the aerosols/air pollution nor in

the water effluent from this process. The air pollutants, generated during the hydro-fracturing process, by evaporation from holding ponds, fugative emissions from transmission lines and other sources, are inhaled by workers, nearby residents and those who live downwind of the multiple sites proposed for this drilling. In addition, we don't understand adequately the ways in which the effluent from the hydro-fracturing process may enter the ground water and hence potentially enter drinking water either through polluted aquifers, wells and reservoirs or through the food chain into the diet of our residents.

The many and diverse effects these chemicals can have on the endocrine system depend upon their concentration, route, chronicity, pharmacogenetics, and interactions with particular hosts. Many of these agents need only be present in minute concentrations to provide an effect on the endocrine system. Some of these endocrine disruptors can be more potent at lower concentrations because at higher concentrations they down-regulate the receptors they bind to. The body readily excretes some disruptors and others accumulate in the body or have an extended half-life.

It is my professional opinion that we cannot allow these complex issues to remain unstudied. In addition, I believe the Department of Environmental Conservation (DEC) of New York State is being negligent in its duty not to provide due diligence in studying these potential endocrine health hazards in detail prior to authorizing any gas drilling in our state. The word "endocrine" does not appear in the dSGEIS, indicating these endocrine impacts have not been recognized or considered. The DEC needs to make use of the data already accumulated in other regions during gas drilling. The DEC should compel the companies involved in gas drilling to disclose in detail the composition of their additives to the large volumes of water used in hydro-fracturing of the Marcellus Shale. It is imperative that the DEC include an assessment of the risks and potential exposure to endocrine disrupting chemicals from the gas drilling process in their consideration of environmental impacts.

Here I list some of the potential clinical endocrine problems that may result from gas drilling if we do not require the DEC to perform due diligence. A detailed discussion can be found in reference 2.

Reproductive system:

Ambiguous genitalia, infertility, tumors of reproductive organs including ovaries, testes, breasts and prostate gland. Polycystic ovary syndrome.

The thyroid gland:

Hyperthyroidism, hypothyroidism, goiter and thyroid cancer

Bone metabolism:

Osteoporosis, osteomalacia, bone cancers

Neuro-endocrine system:

Hypothalamic-pituitary interference resulting in effects upon the thyroid, reproductive,

growth, adrenal systems

Diabetes and metabolic systems:

Appetite regulation, insulin resistance, the metabolic syndrome.

When I reviewed dSGEIS I noticed there is nothing about endocrine disruptors and as an endocrinologist who will have to deal with the patients presenting with novel endocrine disease I feel this document is flawed and should be withdrawn.

In closing, I want to point out that I have addressed the potential effects of chemicals in hydro-fracturing fluids or effluent from gas drilling on the endocrine system of humans. In human medicine there are many other physiological systems that also may also be affected or disrupted by these or other chemicals. It is my considered judgment that there needs to be a fuller, more comprehensive and transparent study of these medical consequences of gas drilling before New York State gives the go-ahead for extraction of the gas reserves in the Marcellus Shale. This due diligence is the role of the NYS DEC and this is clearly defined in their well-considered mission statement<sup>4</sup>:

"To conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being."

Sincerely yours,

Adam Law, M.D., F.R.C.P. (UK)

cc DEC

Senator Charles Schumer

Senator Kirsten Gillibrand

Congressman Maurice Hinchey

Assemblywoman Barbara Lifton

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<sup>1</sup> **Publications:**

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<sup>2</sup> *Endocrine Reviews*, June 2009, 30(4):293–342

Available online: [www.endo-society.org/journals/.../upload/edc\\_scientific\\_statement.pdf](http://www.endo-society.org/journals/.../upload/edc_scientific_statement.pdf)

<sup>3</sup> I want to acknowledge and thank Dr. Theo Colborn whose organization “The Endocrine Disruption Exchange” and the excellent website has done so much to collate the information on the endocrine effects of gas drilling. Dr. Colburn was generous with her time in discussing these issues with me. She drew my attention to the data already in existence which has been posted on the TEDX website:

<http://www.endocrinedisruption.com/chemicals.pits.php><http://www.endocrinedisruption.com/chemicals.pits.php>

<sup>4</sup> <http://www.dec.ny.gov/24.html>